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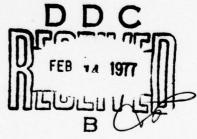
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TECHNICAL MEMORANDUM 2-77

TABLES OF REQUIRED SAMPLE SIZE FOR PAIRWISE COMPARISONS

BY HENRY I. JEHAN, JR. 7 FEBRUARY 1977

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probability of occurrence.

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TABLES OF REQUIRED SAMPLE SIZE FOR PAIRWISE COMPARISONS

- 1. The tables at appendixes A and B have been assembled to provide a ready reference to the sample sizes required to make pairwise comparisons between populations at specified levels of confidence (α and β) and descrimination (Δ). They assume normally distributed data at a predicatable probability of occurence.
- 2. The tables can be used to identify the sample size required to show a given level of descrimination at a given level of confidence when comparing two populations or to identify the levels of confidence and discrimination available from a given sample size.

Example 1. Find the sample size required to test for a \pm 0.10 difference between two rifled projectiles at a producer's risk of 0.15 and a user's risk of 0.10. Historically, the probability of hit for such devices is 0.30.

P(A) = Probability of occurrence = 0.30

 β = Consumer's risk (probability of a type II error) = 0.10

 α = Producer's risk (probability of a type I error) = 0.15

a = Difference between systems = + 0.10

Because the sign of the difference does not matter we look in Table A and find N = 168. The comparative sample must be 168 rounds from each system.

Example 2. Given that the cost considerations applied to Example 1 limit the sample size to 50 rounds, determine the levels of α , β , and Δ attainable.

Because the problem is the same as in example, Table A is used. Looking in the table for various N's near 50, we find the following.

N A To you telescone.	α	В	Δ
50	0.250	0.150	0.150
47	0.200	0.200	0.150
47	0.150	0.250	0.150
51	0.200	0.050	0.200
51 (10009 1)	0.100	0.100	0.200
47	0.050	0.200	0.200
50	0.050	0.050	0.250

This data represents the best mixes of α , β , and Δ available with a sample size of 50 if the probability of occurrence is 0.30. The smallest measurable difference is 0.15. If this is greater than the difference between the current system and the design criteria of the new system (i.e., probability of hit in the ROC is 0.40; therefore, Δ in the ROC equals 0.10). The test at this sample size will involve risks greater than .25.

APPENDIX A

-	
SAMPLE SIZE REGUIRED IL DETECT A DIFEERENCE OF PRESCRIBED MAGNITUDE FROM A	STANDARD PROPORTION AHEN THE SIGN OF THE DIFFERENCE IN NOT INDODITANT
MAGA	CN
0	1
PRESCRIBE	FFFFFNCF
14	-
REACE OF	1 THE
1 DIFEE	F SIGN
13	1
25.11	MINE
71 0	NOIL
REDUIRE	PROP SR
S12E	LANDARD
SAMPLE	

REFERENCE: AMCP 706-111, PARAGRAPH 8-1.4

JCH EXHIBIT THE PERTIMENT IREMENTS OF A SPECIFICATION		0UAL TO 0.5			To Manual Control
PROBABILITY OF HECURANCE IS THE MADRY PROPORTION OF THE POPULATION OF STANDARD ITEMS WHICH EXHIBIT IME PERTINENT CHARACTERISTIC. THIS HAY BE KNOWN FROM THE PROCESS HISTORY, OR MAY BE GIVEN BY THE REQUIREMENTS OF A SPECIFICATION OR A STANDARD		PRUBABILITY DE DECURANCE PLUS DELTA. LE PROBABILITY DE DECURANCE IS LESS THAN DR EQUAL TO 0.5 PRUBABILITY DE DECURANCE MINJS DELTA LE PROBABILITY DE DECURANCE IS GREATER THAN 0.5	2	1-ALPHA/2 1-8ET4	PROBABILITY OF DEVIATION) (2) Y ABSERME COMME BOOT OF PROPARTY TY OF SCHOOLS
F HCCURANCE 15 THE KNOWN FROM THE PROCESS.	PRUBABILITY OF DEVIATION IS CUMPUTED AS:	IIY DE OCCURANCE PLUS DELIA, IF PRÚBA ITY LE OCCURANCE MINUS DELTA IF PRUBA		X	WHERE D = (2 X ARCSINE SOUARE ROOT OF PROBABILITY OF DEVIAT
PRUBABILITY AF CHARACTERISTIC DR A STANDARD	PRUBABILITY	PRUBABIL PRUEABIL	EQUATION		WHERE D = (2 X

SAMPLE SIZE IN) FOR A GIVEN VALUE OF MAGMITUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

c E (

	0000	AL PHA	- 100	100	.150	ALPHA	200	ALPHA	250
	SAMPLE	DELTA	SAMPLE		SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050.	351	350.	293		151	.050	232	050	211
.100	110	.100	26		81	.100	73	.100	99
150	58	.150	84	-	- 45	.150	3.8	.150	35
.200	37	.200	31		27	.200	52	.200	22
.250	26	.250	22		19	.250	18	.250	16
	PROBABILITY	13	DCCURANCE =	.050 PR	PROBABILITY O	JE TYPE 11	ERRUR (BETA)	4)100	
AH O IV	050	AH DHA	100	ALGIA	160	V II O IV	006	ALGIA	250
1	2000			1	3 14 11 2		200	1 1 1 2 0	
DELLA	SAMPLE	DELTA	SAMPLE	DELIA	SAMPLE	DELIA	SAMPLE	UELIA	SAMPLE
050.	527	050.	757	050.	107	2000	9/1	000.	ומח
.100	68	.100	73	.100	63	.100	99	.100	20
.150	24	.150	38	.150	33	.150	- 58	.150	27
200	3.0	000	25	. 200	71	-200	19	.200	17
250	- 17	250	18	250	15	.250	14	.250	12-
	PROBABILITY	3	ECCURANCE .	.050 PR	PRUBABILITY U	F TYPE 11	ERROR (BETA)	A) = .150	
ALP HA	050	AL PHA	100	ALPHA	- 150	ALPHA	200	ALPHA	250
DELTA	SAMPLE	DEL TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	263	0.50	195	050	166	050	146	050	129
.100	76	100	61	. 100	52	.100	94	.100	41
.150	40	150	32	150	28	150	24	.150	22
200	26	200	21	.200	18	.200	16	.200	14
.250	18	.250	15	.250	13	.250	11	.250	10
	PRUBABILITY	4	DCCURANCE =	050	PROBABILITY	DE TYPE 11	EARDR (BETA	A) s 200	
ALPHA	050	AL PHA	100	ALPHA	150	ALPHA	200	ALPHA	250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050	216	.050	167	.050	141	.050	122	.050	108
.100	19	.100	53	.100	55	.100	39	.100	34
150	35	150	28	150	23	150	-20	150	18
.200	23	.200	18	. 200	15	.200	13	.200	21
	PROBABILITY	1		0	1	-	ERROR (BETA)		
71 P H A		AI PHA	- 100	ALPHA	-150	AL PHA	200	ALP HA	.250
1	٠	DEL TA	CAMPIE	DELTA	CAMDIF	DELTA	CAMPIF	DELTA	CAMPIE
050	188	050	146	050	121	050	104	050	06
100	65	100	46	.100	38	100	33	100	29
150	3.1	-150	24	150	20	150	17	150	15
.200	20	200	16	. 200	13	.200	11	.200	2
25.0	17.		•	260	o	250	•	26.0	7

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4.

SAMPLE SIZE (N) FOR A GIVEN VALUE OF MAGNITUDE (DELIA), WITH A SPECIFIC PROBABILITY OF A IYPE I ERROR (ALPHA) FOR

= 0

	SAM	3		-	.200 30		100	ALPHA - 250	S						150	"	SA	7		1000	-	200		SAP	-	.100		002.		4	DELTA SAMPLE	-	25001.	
0000	SAMPLE	372	107	53	33	53	ERROR (BETA)	. 000	SAMPLE	585	82	41	52		ERRUR (BETA)	002.	SAMPLE	233	67	5.5	14	ERROR (BETA)	200	SAMPLE	196	57	28	1:	ERROR (BETA)	200	SAMPLE	100	3 6	
ALPHA	DELTA	050.	.100	.150	.200	.250	3F TYPE 11	AHOHA	DELTA	050	.100	.150	.200	.250	F IYPE 11	ALPHA	DELTA	050	.100	000	.250	DF 1YPE 11	ALPHA	DELTA	.050	.100	000	0020	F 1YPE 11	ALPHA	DELTA	050.	150	77.
153	SAMPLE	413	119	5.9	36	52	PRUBABILITY 3	051	SAMPLE	322	9.5	46	28	1	RUBABILITY O	- 150	SAMPLE	266		26	16	PRUBABILITY O	150	SAMPLE	226	65	25	3.	PROBABILITY	150	SAMPLE	***	900	
ALPHA	DELTA	050.	.100	-150	002.	.250	.100 PR	AHDIA	DELTA	050	.100	.150	. 200	250	100	ALPHA	DELTA	050	.100	200	250	00	ALPHA	DELTA	.050	.130	000	002.	100 PR	ALPHA	DELTA	050	.100	757
100	SAMPLE	470	135	67	41	5.8		001	SAMPLE	372	101	5.3	33	23		. 100	SAMPLE	312	06	280	6	-	100	SAMPLE	697	77	38	47		100	SAMPLE	234	19	23
AL PHA	DELTA	.050	.100	-150	.200	.250	TY UF DECURANC	AHG 14	DELTA	.050	.100	.150	.200		TY OF OCCURANCE	AL PHA	DELTA	050	.100	200	.250	IY OF OCCURANCE	ALPHA	DEL TA	.050	.100	200	002.	>	AL PHA	DELTA	050	.100	20011
- 1	SAMPLE	504	162	- 80	64	34	PRUBABILIT	050	SAMPLE	456	131	59	04	28	PRUBASILIT		SAMPLE	390	112	375	24	PROBABILII	.050	SAMPLE	341	86	100	3.0	PRUBABILIT	.050	SAMPLE	105	18	4.7
ALP HA =	DELTA	050.	.100	.150	.200	.250		- AH O IV	DELTA	050	.100	.150	.200	250		ALP.HA =	DELTA	050	.100	2000	.250		ALPHA .	DELTA	050	.100	150	002.		ALPHA	DELTA	050	.100	יוכוי

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SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT

6 = 6

	.050	AL PHA	= .100	ALPHA	= .150	ALPHA	200	ALPHA	250
SAM	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
_	743	050	623	.050	548	050.	493	050.	7 50
~	505	.100	171	.100	151	.100	136	.100	124
-	66	150	82	. 150	72	-150		150	85
	66	.200	65	. 200	43	.200	39	.200	36
	04	.250	33	.250	53	.250	97	.250	57
	PRUBABILIT	IY UF DCCURANCE		.150 PR	PRUBABILITY U	DF TYPE 11	ERRUR (BETA	11 = .100	
	050	AL PHA	100	АТРИА	- 150	AL PHA	. 200	AL PHA	250
	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
	605	.050	493	.050	426	050-	378	050	340
	166	.100	136	.100	117	.100	104	.100	76
	80	.150	6.5	150	26	.150	5.0	150	45
	84	.200	39	002.	34	.200	30	.200	27
1	32-	250	56	.250	23	.250	20	-250	18
	PRUBABILIT	TY DE DECURANCE		150 P.R.	PROBABILITY	OF TYPE 11	ERRUR (BETA	11 = .150	1
11	.050	AL PHA	- 100	ALPHA	150	ALPHA	.200	AL PHA	250
	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
1	516	050	414	050	353	050	300	050	275
	142	.100	114	.100	16	.100	8.5	.100	92
-	89	.150	55	150	14	.150	41	150	37
	41	.200	33	.200	28	•500	52	•500	22
	28	1	22	. 250			11		15
1	PROBABILIT	IY OF DECURANCE	RANCE =	150 PR	PROBABILITY	DE TYPE 11	ERRUR (BETA	7 500	
10	.050	AL PHA	= 100	ALPHA	= ,150	ALPHA	.200	ALP HA	250
	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
	452	050	356	• 050	300	.050	260	.050	553
	124	.100	86	.100	83	.100	72	.100	63
1	99	150	47	150	40	150	35	150	30
	36	.200	58	. 200	5.4	.200	2.1	.200	18
1	24	250	19	250	16	.250	14	.250	13
	PRUBABILIT	TY DE DCCURANCE .	İ	150 PR	PROBABILITY	DE TYPE 11	ERROR (BETA	11250	
"	050	AL PHA	- 100	ALPHA	- 153	ALPHA	- 200	ALPHA	- 250
	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
-	399	050	310	.050	257	.050	220	050	192
	110	.100	85	.100	17	.100	61	.100	53
-	53	•150	4.1	.150	34	.150	58	.150	26.
	32	•500	52	. 200	21	.200	18	.200	16
		4 7 7							

SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT SAMPLE SIZE (N) FOR A GIVEN VALUE OF MAGNITUDE (DELIA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

:

250	SAMPLE	544	146	69	40	27		360	CAMPIE	412	110	52	31	21		.250	SAMPLE	333	68	4.2	52	1.1		250	SAMPLE	277	74	35	77	4	250	SAMPLE	232	62	53	
ALPHA	DELTA	050	.100	150	200	.250	100	ALGIA	A 1 1 2 0	050	100	.150	.200	-250	1 = .150	ALPHA	DELTA	050	.100	.150	.200	.250	1 = .200	ALPHA	DELTA	.050	.100	150	007.	1	ALP HA	DELTA	.050	.100	.150	
.200	SAMPLE	965	160	75	77	30	ERRUR (BETA	, 000	2 10 10	2 H F L E	123	28	34	23	ERROR (BETA	.200	SAMPLE	374	100	14	28	19	ERRUR IBETA	.200	SAMPLE	314	9.4	09	57	TYPE 11 ERROR (BETA	.200	SAMPLE	267	7.2	34	
ALPHA =	DELTA	050	.100	150	200	.250	F TYPE 11	Andia	0 51 7 8	050	100	150	.200	.250	0F TYPE 11 E	ALPHA =	DELTA	050	.100	.150	.200	.250	DE TYPE 11 E	ALPHA =	DELTA	.050	.100	150	007.	0F TYPE 11 E	AL PHA .	DELTA	.050	.100	.150	
.150	AMPL E	662	177	8.3	3	33	PRUBABILITY O	150	CAMP.	516	138	65	38	26	PROBABILITY O	.150	SAMPLE	427	114	54	32	21	PROBABILITY 3	.150	SAMPLE	363	16	44	17	PRUBABILITY D	.150	SAMPLE	311	**	3.5	
ALPHA	DELTA	.050	.100	150	. 200	.250	-200 PRE	4	7617	050	100	150	.200	.250	.200 PRC	ALPHA =	DELTA	050	.100	.150	. 200	250	200 PRU	ALPHA =	DELTA	. 050	.100	150	002.	200 025	ALPHA =	DELTA	.050	.100	150	
100	SAMPLE	753	202	50	5.5	37	u	001	CAMBIE	206	160	75	55	30		.100	SAMPLE	500	134	63	37	25		100	SAMPLE	431	115	25	35		160	SAMPLE	375	100	47	
AL PHA =	DELTA	050	.100	7 50	.200	-250	TY DE DECURANCE	ALD IA	DEI 18	050	100	.150	.200	.250	TY DE DECURANCE	AL PHA =	DELTA	050	.100	.150	.200	.250	TY DE DECURANCE	AL PHA =	DELTA	.050	.100	150	007.	LY OF OCCURANCE	AL PHA =	DEL TA	.050	.100	.150	
1	SAMPLE	306	242	114	67	45	PAUSABILITY B	0.50	-	732	196	- 76	54	36	PRUBABILITY		SAMPLE	625	167	19	94	31	PRDBABILITY O		SAMPLE	275	146	69	1,	PRIBABILITY D	050	SAMPLE	4.83	129	61	
ALPhu =	DELTA	050	.100	150	.200	.250		ALD HA		050	100	150	.200	-250		ALP HA =	DELTA	050	.100	150	.200	.250		ALPHA =	DELTA	050	.100	150	002.	067	ALPHA =	DELTA	050	.100	.150	

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SEMPLE SIZES FOR PAIRED ANALYSIS NHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT

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ALP HA	050. =	AL PHA	= .100	ALPHA	150	ALPHA	200	ALP HA =	.250
066.74	SAMPLE	DEL TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050.	1035	050	862	050.	753	050	682	050.	622
.100	272	.100	526	.100	661	.100	179	.100	164
-041	126	.150	105	150	76	.150	83	150	76
.200	73	.200	61	. 200	54	.200	8,7	.200	55
.250	84	-250	640	.250	35	.250	3.2	.250	58
	PRUBABILIT	ITY OF OCCURANCE	4	.250 PR	PRUBABILITY O	BE TYPE 11	ERRUR (BETA	A) = .100	
ALP HA	050	AL PHA	- 100	ALPHA	153	AL PHA	200	ALP HA =	.250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	8.37	.050	682	.050	290	.050	524	050	471
.100	220	.100	179	.100	155	.100	138	.100	124
.150	102	.150	83	150	72	.150	79	.150	57
.200	65	.200	6,5	. 200	42	.200	37	.200	33
250	33	.250	32	.250	28	.250	24	.250	22
AH P HA	050* =	AL PHA	- 100	ALPHA	150	ALPHA	• .200	ALPHA =	.250
AL PHA		AL PHA	- 100	ALPHA	150	ALPHA	002.	ALPHA =	.250
DELLA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPL
100	188	100	150	100	128	001	113	100	100
150	87	150	70	150	90	150	52	150	47
.200	51	.200	41	. 200	35	.200	30	.200	27
.250	33		27	.250	23	20	~	.250	18
Y TO IV	- PRUBABILII	X CE	DCCURANCE =	250 250	PRDBABILITY D	OF TYPE 11	ERROR (BETA	11 = .200	03.0
	1	The state of	2	44.50		******		200	2000
DEL! A	54MPLE 425	050	SAMPLE 493	DELIA	SAMPL F	DELLA	SAMPLE	050	SAMPLE
000	164	100	130	100	000	000	200		200
150	42	150	90.	150	51	150	44	150	30
.200	545	.200	35	.200	33	.200	56	.200	23
.250	29	.250	23	.250	19	.250	17	.250	15
	PROBABILIT	ITY DE DCCURANCE	IRANCE =	250 PR	RUBABILITY O	DF TYPE 11	ERROR (BETA	A1 = .250	
AH P HA	050	AL PHA	100	ALPHA	150	ALPHA	200	ALPHA =	.250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	553	.050	429	.050	356	.050	305	050	265
.100	145	.100	113	.100	56	.100	80	.100	70
.150	1.9	.150	-52	.150	44	.150	3.7	.150	33
200	30	300		000					

SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE LIFFERENCE IS NOT IMPORTANT

SAMPLE	DELTA		ALPHA	=150	ALPHA =	.200	ALPHA =	.250
		SIGNAS	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
1734	2000	644	050.	335	.053	751	050	685
205	001.	246	.100	216	001.	194	.100	171
127	•	711	061.	7.7	001.	, ,	000	10
200	.255.	2 3	.250	37	.250	33.	.250	30
PRUBABILIT	Y		.300 PR	OBABILITY O	JE TYPE 11 E	ERRUR (BETA	1) = .100	
650	At PHA	100	ALPHA	150	AL PAR		AL PHA =	.250
E OHV	DFI TA	SAMPLE	DELTA	SAMPLE		4	DELTA	SAMPLE
922	.050	751	050	650	.050	577	050	519
238	.100	194	.100	166	.100	149	.100	134
109	.150	68	.150	77	051.	89	.150	29
63	.200	51	.200	55	.200	39	.200	35
			VHOIV	167		200		250
€ 050	AL PHA	- 100	ALPHA	150	ALPHA =	200	ALPHA =	.250
SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
504	.100	163	.100	133	.100	122	.100	109
83	.150	. 75	.150	• •	.150	95	.150	20
54	.200	43	. 200	37	• 200	32	•500	53
35	F	88	. 250		.250		.250	19
PRUBABILII	*		300	PRUBABILITY C	DE TYPE 11 E	ERROR IBETA	11 = .200	
× .050	AL PHA	- 100	ALPHA	= .150	ALPHA =	200	ALPHA =	.250
SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
689	.050	543	.050	155	.050	396	050	348
173	.100	141	.100	118	.100	103	.100	06
14	.200	37	. 200	31	.200	2.7	.200	54
30	.250	24	.250	20	.250	18	.250	16
PRUBABILIT	TY DE OCCURANCE		300 PR	PRUBABILITY	3F TYPE 11 6	ERROR (BETA	11250	
050	AL PHA	- 100	ALPHA	153	ALPHA =	2002	ALPHA =	.250
SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
608	050	472	050	392	050	336	050	292
158	.100	122	.100	102	.100	87	.100	2
7.5	.150	56	. 150	14	.150	6.0	.150	35
15	200					•		

SAMPLE SIZES FUR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT

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SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT SAMPLE SIZE (W) FOR A GIVEN VALUE OF MAGNITUDE (DELTA), WITH A SPECIFIC PRUBABILITY OF A TYPE I ERROR (ALPHA) FOR

ALP HA = .250	SA		.100 193	.150 86	65 002		• .100	"	SA	.050 578			2500 37		ALPHA = .250	SA	1050 467	150		.250 19	200	ALP HA = .250	SA	.050 388		2000 25	.250 16	250	1	S	-	
200	SAMPLE	837	212	56	53	34	ERROR (BETA)	200	SAMPLE	643	163	73	41	ERRO	200	SAMPLE	525	133	34	2.1	ERROR (BETA)		SAMPLE	441	112	280	18	ERROR (BETA)		SAMPLE	374	90
ALPHA	DELTA	050	.100	.150	. 200	.250	OF TYPE 11	ALPHA	DELTA	.050	.100	.150	.200	DE TYPE 11	ALPHA	DELTA	050	001.	.200	.250	UF IYPE II	ALPHA	DELTA	050.	.100	200	.250	DF TYPE 11	ALPHA	DELTA	.050	100
- 150	SAMPLE	433	235	105	65	38	PRUBABILITY	150	SAMPLE	724	183	82	940	PRUBABILITY	150	SAMPLE	203	152	38	57	RUBABILITY	- 150	SAMPLE	609	129	33	21	ROBABILITY	= .150	SAMPLE	437	111
ALPHA	DELTA	.050	.100	.150	007.	. 550	d 007.		0	-			. 200	004	ALPHA	DELTA	050	150	. 200	.250	400 b	ALPHA	DELTA	.050	.100	200	250	d 007.	ALPHA	DELTA	.050	100
= .100	SANPLE	1032	267	120	19	43	UCCURANCE = .	- 100	SAMPLE	837	212	95	53	CCCURANCE =	- 100	SAMPLE	702	8/1	4 0	67	DCCURANCE .	- 100	SAMPLE	909	153	6.	25	OCCURANCE	100	SAMPLE	526	122
AL PHA	DFLTA	950.	.100	.150	.200	.250	4	AL PHA	DELTA	050	.100	.150	.200	<u>د</u>	AL PHA	DEL TA	050	001.	500	.250	E.	AL PHA	DELTA	05 ℃	001.	200	250	10	AL PHA	DELTA	050	100
.050	SAMPLE	1275	321	143	==	2.1	PROBLETLITY	050. =	SAMPLE	1027	263	116	65	PRDBABILITY	- 059	SAMPLE	877	222	55	36	PRUBABILITY	- 050	SAMPLE	767	194	5 3	31	PRUBABILITY		SAMPLE	674	173
"THE H	DELTA	950.	001.	.150	262.	.250			DELTA	050	.100	.150	2500		AL P HS.	DELTA	050	001.	200	.250		ALPHA	UELTA	.050	001.	200	25.0			DELTA	050	000

STARTE STEES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT (ALPHA) FOR (ALPHA) FOR

Ci.

11. DELTA = .150	ALPHA = .150	ALPHA = .150	ALPHA = .150	OFFITA SAMPLE OFFITA O	O	C	4						
11. DELIA SAPPLE DELTA SAPPLE DELTA SAPPLE DELTA (1.00) 11.50	11. DELIA SAPPLE DELTA SAPPLE DELTA (1.1)	11. DELIA SANDLE DELTA SANDLE SEGO S 3 .200 S 3 .250 S 5	11. DELIA SANPLE DELIA SAMPLE DELIA SANPLE D	11. DELITA SAMPLE DELTA SAMPLE DELTA 11. DELITA SAMPLE DELTA SAMPLE DELTA 12. 250 13. 250 14. 250 15.	Control Cont	C		"					ALPHA =
- 450	- 450	- 450	150 100 233 100 214 100 215 10	150 234 100 21	100 234 100 21	150 100 234 100 214 10				2	DELTA	SAMPLE	DELTA
- 450 PRUBABILITY OF TYPE II ERROR (BETA) = .150 - 250	- 450	- 450 PRUBABILITY OF TYPE II ERROR (BETA) = .150 - 250 53 .250 - 250 59 .200 53 .250 - 250 44PHA = .150 44PHA = .200 44PHA = .200 - 100 185 .150 164 .150 - 250 45 .250 29 .250 - 250 29 .250 29 .250 - 250 PRUBABILITY OF TYPE II ERROR (BETA) = .150 - 250 0.100 185 .150 41 .200 - 250 29 .250 26 .250 - 450 PRUBABILITY OF TYPE II ERROR (BETA) = .150 - 250 29 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 24 .250 29 .250 - 250 28 .250 .250 - 250 28 .250 .250 - 250 28 .250	= .450	200 59 53 500 50 50 50 50 50 50 50 50 50 50 50 50	= .450	150 150 150 150 150 150 150 150 150 150					100	214	001
250 59 .200 53 .200 53 .200 6 .200 6 .250 6	250 59 .200 53 .200 53 .200 250 .250 250 .250 250 .250 250 250 250 250 250 250 250 250 250	250 59 .200 53 .200 53 .200 250 .250 250 .250 250 .250 250 250 250 250 250 250 250 250 250	250 53200 53250 53250 2.250	250 53200 53250 53250 2.250	250 59 200 59 200 59 200 59 200 20 20 200 200 200 200 200 200 200	250 53 .200 55 .250 53 .250 53 .250 55 .250 55 .250 55 .250 55 .250 55 .250 55 .250 55 .250 55 .250 55 .250 57		7			.150	56	.150
2 .250 37 .250 33 .250 = .450	2 .250 37 .250 33 .250 = .450	2 .250 37 .250 33 .250 250 250 250 250 250 250 250 250 250	2 .250 37 .250 33 .250 25 .250 25 .250 25 .250 25 .250 25 .200 24 .200 24 .200 25 .200 25 .200 25 .200 25 .200 25 .200 25 .200 25 .200 25 .200 25 .200 25 .200 25 .250	2 .250 37 .250 33 .250 25 .250	25. 250 33250 33250 = .450	2 . 250 37 . 250 33250 2 . 450					.200	53	.200
= .450 PRUBABILITY OF TYPE II ERROR (BETA) = .100 4 ALPHA = .150 4 C. 100 4 C. 100 4 C. 100 185 150 4 C. 100 185 150 4 C. 100 185 150 4 C. 100 185 185 180 180 180 180 180	= .450 PRUBABILITY DF TYPE II ERROR (BETA) = .100 4 LPHA = .150 6 LLTA SAMPLE DELTA SAMPLE DELTA .050 4 .100 185 .100 5 .200 42 5 .250 24 .250 6 .250 24 .250 6 .250 24 .250 7 3 .250 7 3 .250 7 3 .250 7 3 .250 7 4 .250 7 5 .250 7 6 .250 7 6 .250 7 7 8 .250 7 8 .250 8 .250 41 .250 8 .250 812 .250 8 .250 814 8 .200 8 .250 33 .200 8 .250 33 .200 8 .250 34 .150 8 .250 34 .250 8 .250 37 .250 8 .250 37 .250 8 .250 37 .250 8 .250 37 .250 8 .250 37 .250 8 .250 38 .250 8 .250 38 .250 8 .250 38 .250 8 .250 38 .250 8 .250 38 .250 8 .250 38 .250 9 .250 38 .250 1 8 .250 1 8 .250 1 8 .250 1 8 .250 1 8 .250 2 .250 2 .250 2 .250 2 .250 3 .250 4 .250 5 .250 6 .250 6 .250 7 .250 8 .250	- 450 PRUBABILITY OF TYPE II ERROR (BETA) = .100 4	= .450 PRUBABILITY DF TYPE II ERRUR (BETA) = .100 4 PRUBABILITY DF TYPE II ERRUR (BETA) = .100 4 0.050	= .450 PRUBABILITY DF TYPE II ERRUR (BETA) = .100 4 PRUBABILITY DF TYPE II ERRUR (BETA) = .100 4 0.050	= .450	= .450 PRLBABILITY DF TYPE II ERRGR (BETA) = .100 4					.250	33	.250
LE DELTA SAMPLE DE	LE DELTA SAMPLE SAMPLE DELTA SA	LE DELTA SAMPLE DE	LE DELTA SAMPLE DE	LE DELTA SAMPLE SAMPLE DELTA SA	LE DELTA SAMPLE DE	LE DELTA SAMPLE DE	PRUBABILITY OF	DCCURANCE		PRUBABILITY	DE TYPE II E	RROR (BETA	
LE DELTA SAMPLE DELTA SAMPLE DELTA (1900) 4	LE DELTA SAMPLE DELTA SAMPLE DELTA (SAMPLE D	LE DELTA SAMPLE DELTA SAMPLE DELTA (SAMPLE (SAMP	LE DELTA SAMPLE DELTA SAMPLE DELTA - 050 - 139 - 050 - 150 - 150 - 150 - 150 - 150 - 29 - 200 - 41 - 150 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 29 - 250 - 20	LE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA (100 185 - 100 164 - 100 185 - 150 41 - 100 185 - 150 41 - 100 185 - 150 41 - 150 45 - 150 41 - 150 45 - 150 41 - 150 45 - 150 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100 41 - 100	LE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA	LE DELTA SAMPLE DELTA SAMPLE DELTA CAMPLE DELTA CAMPLE DELTA CASO CASO CASO CASO CASO CASO CASO CAS		"	-	"			ALPHA =
4 .050 739 .050 656 .050 .050 656 .050 739 .050 185 .100 164 .100 164 .100 185 .150 73 .150 73 .150 73 .150 73 .150 73 .150 73 .150 73 .150 73 .150 73 .150 73 .150 73 .150 73 .150 74 .250 75 .250 75 .250 75 .250 75 .150 75	4 .050 739 .050 656 .050 4 .100 185 .150 164 .100 3 .250 45 .250 41 .200 3 .250 29 .250 26 .250 2 .250 29 .250 26 .250 2 .250 29 .250 26 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 2 .250 9 .250 9 .250 3 .250 9 .250 9 .250 3 .250 9 .250 9 .250 4 .250 9 .250 9 .250 5 .250 9 .250 9 .250 6 .250 9 .250 9 .250 6 .250 9 .250 9 .250 6 .250 9 .250 9 .250 6 .250 9 .250 9 .250 6 .250 9 .250 9 .250 6 .250 9 .250 9 .250	4 .050 739 .050 656 .050 656 .050 4 .100 185 .150 164 .100 185 .150 41 .200 45 .250 41 .200 45 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .150 26 .150 20 .150 26 .150 26 .150 26 .150 26 .150 26 .150 26 .150 26 .150 20 .150 26	4 .050 739 .050 656 .050 .050 164 .100 165 .100 165 .100 165 .100 165 .100 165 .100 165 .100 165 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 27 .250	4 .050 739 .050 656 .050 .050 656 .050 .100 185 .150 164 .100 164 .100 185 .150 41 .250 26 .250 41 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 27 .25	4 .050 739 .050 656 .050 .050 656 .050 .100 185 .100 164 .100 165 .100 165 .100 165 .100 165 .100 165 .100 165 .100 165 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 27 .250 2	4 .050 739 .050 656 .050 .050 45 .100 164 .100 165 .100 165 .100 165 .100 165 .100 165 .100 165 .100 165 .100 165 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 21 2 .250 25 .250 21 .250 25 .250 25 .250 25 .250 25 .250 25 .250 25 .250 26 .2	0		٥		DELTA	SAMPLE	DELTA
4 .100 185 .100 164 .100 150 82 .200 43 .250 24 .250 74 .250 25 .250 24 .250 26 .250 24 .250 27 .250 24 .250 28 .250 24 .250 29 .250 ALPHA = .250 150 68 .150 134 .100 20 .150 68 .150 33 .200 24 .250 33 .200 25 .250 24 .250 26 .250 34 .250 27 .250 35 .250 28 .250 24 .250 29 .250 35 .250 20 ALPHA = .200 20 ALPHA = .200 21 .250 22 .250 .250 23 .250 .250 24 .250 .250 25 .250 26 .250 27 .250 28 .250 29 .250	4 . 100 185 . 100 164 . 150 3 . 200 45 . 200 41 . 250 3 . 200 65 . 250 26 . 250 3 . 250 29 . 250 26 . 250 ALPHA = .150 ALPHA = .200 ALPHA = .200 DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA . 150 150 68 . 150 68 . 150 200 38200 33200 200 38200 ALPHA = .200 ALPHA = .150 ALPHA = .200 ALPHA = .150 ALPHA = .200 ALPHA = .150 ALPHA = .200 250 ALPHA = .250	4 .100 185 .100 164 .100 5 .200 82 .200 74 .250 6 .200 24 .250 7 .250 74 .250 2 .250 24 .250 8 .250 26 .250 26 .250 10 0 .150	4 .100 185 .100 164 .100 3 .200 45 .200 41 .250 2 .250 29 .250 26 .250 4 .250 29 .250 5 .250 24 .250 6 .250 26 .250 6 .250 ALPHA = .150 6 .150 153 .100 150 153 .100 150 150 68 .250 6 .200 33 .200 6 .200 33 .200 6 .200 41 .200 6 .200 39 .200 7 .200 39 .200 6 .200 41 .200 6 .200 39 .200 6 .200 39 .200 7 .200 20	150	4 .100 185 .100 164 .100 3 .200 45 .200 41 .250 2 .250 26 .250 26 .250 4 .250 26 .250 4 .250 26 .250 4 .250 41 .250 4 .250 26 .250 6 .250 812 .250 6 .250 153 .100 134 .150 6 .250 33 .200 4 .250 38 .200 4 .250 38 .200 4 .250 44 .250 6 .250 44 .250 6 .250 44 .250 6 .250 44 .250 6 .250 44 .250 6 .250 44 .250 6 .250 44 .250 6 .250 44 .250 6 .250 44 .250 6 .250 44 .250 6 .250 44 .250 6 .250 44 .250 7 .250 450 .100 7 .250 450 .100 7 .250 450 .100 7 .250 450 .100 7 .250 450 .100 7 .250 26 .250 7 .250 27 .250 7 .250 28 .250 7 .2	4 .100 185 .100 164 .100 3 .200 45 .200 41 .250 2 .250 24 .250 2 .250 24 .250 2 .250 24 .250 2 .250 24 .250 2 .250 24 .250 2 .250 24 .250 2 .250 24 .250 2 .250 24 .250 2 .250 24 .250 2 .250 24 .250 2 .250 33 .250 2 .250 33 .250 2 .250 34 .250 2 .250 34 .250 2 .250 34 .250 2 .250 35 .200 2 .250 37 .250 2 .250 24 .250 2 .250 25 .250 2 .250 26 .250 2 .250 27 .250 2 .250 28 .2		-	-	-	050.	959	050
150	150	150 82 .150 73 .150 73 .150 3 .200 24 .200 24 .200 24 .200 24 .250 26 .250 27 .250 28 .250 28 .250 27 .250 28 .250 27	150 82 .150 73 .150 73 .150 3 .200 20 200 200 200 200 200 200 200 200	150	S	S					.100	164	.100
3 .250 45 .200 41 .200 5 .250 24 .250 26 .250 7 .250 ALPHA = .150 ALPHA = .200 ALPHA = .150 10 .150 .150 .150 .150 1150 .68 .150 .150 .150 1250 .200 39 .200 33 .200 4.50 PRUBABILITY OF TYPE II ERROR (BETA) = .150 2.250 .250 .250 .250 .250 2.250 .250 .250 .250 2.250 .250 .250 .250 2.250 .250 .250 .250 2.250 .250 .250 2.250 .250 .250 .250 2.250 .250 .250 .250 2.250 .250 .250 .250 2.250 .250 .250 .250 2.250 .250 .250 .250 .250	3 .250 45 .200 41 .200 5 .250 24 .250 26 .250 7 .250 ALPHA = .150 ALPHA = .200 ALPHA = .150 10 ALPHA = .150 ALPHA = .200 ALPHA = .150 10 .100 153 .100 134 .100 10 .150 88 .200 33 .200 4 .250 38 .200 33 .200 6 ALPHA = .200 ALPHA = .200 15 .250 24 .250 21 .250 15 .250 38 .200 39 .200 15 .250 38 .200 39 .200 15 .250 38 .200 39 .200 15 .250 38 .200 39 .200 15 .250 38 .200 39 .200 15 .250 38 .200 39 .200 15 .250 38 .200 39 .200 15 .250 38 .200 39 .200 15 .250 38 .200 30 .200 15 .250 32 .250 35 .200 15 .250 32 .250 15 .250 32 .250 15 .250 32 .250	3 .250 45 .200 47 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 26 .250 20 20 20 20 20 20 20 20 20 20 20 20 20	3 .250 45 .200 41 .250 5 .250 24 .250 26 .250 7 .250 26 .250 26 .250 8 .250 ALPHA = .150 ALPHA = .200 ALPHA = .150 100 153 .100 134 .100 1150 68 .150 60 .150 24 .250 38 .250 33 .250 4 .250 38 .250 31 .250 8 .250 8 .250 21 .250 8 .250 8 .250 21 .250 8 .250 8 .250 21 .250 8 .250 8 .250 21 .250 8 .250 8 .250 21 .250 8 .250 8 .250 21 .250 8 .250 8 .250 450 .150 9 .250 28 .250 1 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250 2 .250 28 .250	3 .250 45 .200 41 .250 5 .250 24 .250 26 .250 7 .250 ALPHA = .150 15 .250 ALPHA = .200 15 .200 153 .100 134 .100 15 .200 39 .200 33 .200 4 .250 24 .250 25 .200 4 .250 24 .250 30 .200 15 .250 24 .250 31 .250 16 .250 24 .250 31 .250 17 .250 24 .250 32 .200 18 .250 ALPHA = .200 19 .150 130 .100 113 .100 10 ALPHA = .150 ALPHA = .200 10 ALPHA = .150 ALPHA = .200 11	3 .250 45 .200 41 .250 26 .250 2 .250 26 .250 26 .250 2 .250 26 .250 26 .250 15 .450 ALPHA = .150 ALPHA = .200 ALPHA = .150 10 0 153 .100 134 .150 2 .200 38 .200 33 .200 2 .250 24 .250 27 .250 2 .250 24 .250 27 .250 2 .250 24 .250 27 .250 2 .250 27 .250 27 .250 2 .250 27 .250 27 .250 2 .250 27 .250 ALPHA = .200 ALPHA = .200 2 .250 32 .250 .150 2 .250 32 .250 .250 2 .250 ALPHA = .250 2 .250 ALPHA = .250 3 .250 ALPHA = .250 4 .250 32 .250 4 .250 32 .250 4 .250 32 .250 4 .250 32 .250 5 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 6 .250 22 .250 7 .	3 .250 45 .200 41 .250 2 .250 24 .250 26 .250 2 .250 ALPHA = .150 LE DELTA SAMPLE DELTA SAMPL				-	.150	73	.150
- 450 PRUBABILITY OF TYPE II ERROR (BETA) = .150 ALPHA = .153 ALPHA = .200 ALPHA = .153 ALPHA = .200 ALPHA = .200 ALPHA = .150 ALPHA = .150 ALPHA = .150 ALPHA = .200	450 PRUBABILITY OF TYPE II ERROR (BETA) = .150 ALPHA = .150 ALPHA = .200 ALPHA = .200 LE DELTA SAMPLE DELTA SAMPLE DELTA .100 150 .150 68 .150 60 .150 38 .200 33 .200 ALPHA = .	### ### ##############################	- 450 PRUBABILITY OF TYPE II ERROR (BETA) = .150 ALPHA = .150 ALPHA = .150 ALPHA = .150 ALPHA = .200 ALPHA = .200 ALPHA = .150 ALPHA = .200	450 PRUBABILITY OF TYPE II ERROR (BETA) = .150 ALPHA = .150 ALPHA = .150 ALPHA = .200 ALPHA	### ### ##############################	### ### ##############################		-			.250	561	.250
SAMPLE DELTA SANPLE DELTA SAMPLE DELTA 717 050 612 050 134 .100 134 .100 134 .100 134 .100 134 .100 134 .100 134 .200 44 .200 24 .250 24 .250 24 .250 24 .250 24 .250 24 .250 24 .250 24 .250 24 .250 24 .250 21 .250 24 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 22 .250	LE DELTA SAMPLE DELTA SAMPLE DELTA 7,000 134 .100 134 .100 134 .100 134 .100 134 .100 134 .100 134 .100 135 .250 33 .250 33 .250 33 .250 24 .250 24 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 22 .2	LE DELTA SAMPLE	LE DELTA SAMPLE DELTA SAMPLE DELTA 100 153 .100 134 .100 1150 68 .150 60 .150 4 .250 38 .250 33 .250 8 .250 39 .250 31 .250 ALPHA = .250 ALPHA = .200 ALPHA = .250 .250 ALPHA = .250 ALPHA = .250 150 130 .100 113 .100 150 32 .250 28 .250 450 .250 28 .250 250 250 28 .250 250 250 28 .250 250 250 28 .250 250 250 28 .250 250 250 28 .250 250 250 28 .250 250 250 28 .250 250 250 28 .250 250 250 28 .250 250 250 28 .250 250 250 28 .250 250 260 28 .250 250 260 260 260 260 260 260 260 260 260 26	LE DELTA SAMPLE DELTA SEGO SAS SEGO SAS SEGO SAS SEGO SAS SEGO SAS SEGO SAS SEGO SEGO SAS SEGO SEGO SAS SEGO SEGO SEGO SEGO SEGO SEGO SEGO SEG	LE DELTA SAMPLE DE	LE DELTA SAMPLE DELTA SAMPLE DELTA 7 050 612 050 134 .100 150 153 .100 134 .100 250 24 .250 33 .200 2 .250 24 .250 21 .250 2 .250 24 .250 21 .250 2 .250 33 .200 2 .250 21 .250 2 .250 21 .250 2 .250 22 .250 2 .250 22 .250 2 .250 22 .250 2 .250 .150 .100 3 .200 32 .200 113 .150 2 .200 32 .200 2 .200 32 .250 2 .200 32 .250 2 .250 28 .250 2 .250 20 .250 2 .250 20 .250 2 .250 .250 3 .250 .250 4.50 .250 .250 2 .250 .250 2 .250 .250 3 .250 .250 3 .250 .250 4.50 .250 .250 2 .250 .250 2 .250 .250 3 .250 .250 3 .250 .250 4.50 .250		W N			10	006	ALO IA
LE DELTA SAMPLE DELTA SAMPLE DELTA 1050 612 .050 534 .050 100 153 .100 134 .100 100 153 .200 33 .200 4 .250 24 .250 21 .250 2 .450 PRUBABILITY OF TYPE II ERRUR (BETA) = .200 150 52 .050 520 .050 150 520 .050 150 58 .200 2 .200 2 .200 2 .200 2 .200 2 .200 2 .200 2 .200 2 .200 2 .200 2 .200 2 .200 2 .200 2 .200	LE DELTA SAMPLE DELTA SAMPLE DELTA 1050 612 .050 534 .050 106 153 .100 134 .100 107 150 68 .150 60 .150 24 .250 33 .200 24 .250 21 .250 24 .250 21 .250 25 .250 24 .250 27 .250 24 .250 28 .200 29 ALPHA = .200 ALPHA = .250 250 250 .250 250 250 250 250 250 250 250 250	LE DELTA SAMPLE DELTA SAMPLE DELTA 100 612 -050 534 0050 1100 153 .100 134 .100 120 38 .200 33 .200 134 .100 150 24 .250 24 .200 150 24 .250 21 .250 160 24 .250 21 .250 17 .250 24 .250 21 .250 18 .200 ALPHA = .200 ALPHA = .200 18 .200 32 .200 ALPHA = .200 190 130 .100 113 .100 150 32 .200 28 .200 150 32 .200 28 .200 150 32 .200 28 .200 150 32 .200 28 .200 150 32 .250 250 150 450 .250 250 150 450 .250 250 150 450 .250 250 150 450 .250 250 150 450 .250 250 150 450 .250 250	LE DELTA SAMPLE DELTA SAMPLE DELTA 1050 612 .050 534 .050 106 153 .100 134 .100 10 .200 38 .200 33 .200 24 .250 21 .250 2 .250 24 .250 21 .250 2 .250 24 .250 21 .250 2 .250 24 .250 21 .250 2 .250 24 .250 21 .250 2 .250 24 .250 21 .250 2 .250 24 .250 21 .250 2 .250 25 .250 2 .250 22 .250 28 .250 2 .250 28 .250 2 .250 29 .250 28 .250 2 .250 20 .250 28 .250 2 .250 20 .250 28 .250 2 .250 20 .250 28 .250 2 .250 20 .250 28 .250 2 .250 20 .250 28 .250 2 .250 20 .250 28 .250 2 .250 20 .250 28 .250	LE DELTA SAMPLE DELTA SAMPLE DELTA 100 153100 134100 100 153100 134100 100 153100 134100 24 .250 33200 2 .200 34250 31250 2 .200 24250 21250 2 .200 24250 21250 2 .200 24250 21250 2 .200 252200 28200 2 .250 28200 28250 2 .250 20	LE DELTA SAMPLE DELTA SAMPLE DELTA 100 153 .050 536 .0550 100 153 .100 134 .100 20 .200 33 .200 24 .250 24 .250 33 .200 2 .250 24 .250 21 .250 2 .250 24 .250 21 .250 2 .250 25 .250 2 .250 22 .250 2	LE DELTA SAMPLE DELTA SAMPLE DELTA 100 153 .050 536 .0550 100 153 .100 134 .100 100 153 .200 33 .200 4 .250 24 .250 21 .250 8 .200 34 .250 21 .250 ALPHA # .150 ALPHA # .200 ALPHA # .200 15 .100 130 .100 113 .100 15 .200 32 .200 113 .150 15 .200 32 .200 113 .250 15 .200 32 .200 180 .250 15 .200 32 .200 180 .150 15 .200 32 .200 180 .250 15 .200 32 .200 180 .250 15 .250 32 .200 180 .250 15 .250 32 .250 18 .250 15 .250 32 .250 .250 16 .250 32 .250 .250 17 .250 32 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 .250 18 .250 .250 .250 .250 .250 18 .250 .250 .250 .250 .250 .250 18 .250 .250 .250 .250 .250 .250 .250 18 .250 .250 .250 .250 .250 .250 .250 .250		11		u			ALPHA =
100 150	7 050 612 .050 534 .050 .050 0 .100 153 0 .100 38 0 .200 38 0 .200 33 0 .250 24 250 21 250 24 250 21 250 24 250 21 250 25 250 24 250 33 250 31 250 450 250 450 250 32 250 32 250 32 250 28 250 28 250 28 250 28 250 28 250 28 250 28 250 28 250 28 250 28 250 28 250 250 38 250 28	7 050 612050 534 .050 0 100 153 100 134 0 100 153 100 134 100 150 38 200 33 200 33 200 33 200 24 200 33 200 27 200 ALPHA = 200	7 050 612 .050 536 .050 .050 .050 .050 .050 .050 .050 .05	7 050 612050 536050 0 100 153 0 100 153 0 0 100 153 0 0 0 100 153 0 0 0 100 153 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 050 612 .050 536 .050 .050 .050 .050 .050 .050 .050 .05	7 050 612 .050 536 .050 0 .100 153 .100 134 .100 0 .100 153 .200 33 .200 14 .250 24 .250 21 .250 8 .200 34 .250 21 .250 8 .250 ALPHA = .250 ALPHA = .200 15 .100 130 .100 113 .100 15 .200 32 .200 113 .100 15 .200 32 .200 28 .250 15 .200 32 .200 18 .250 15 .200 32 .200 18 .250 15 .200 32 .200 28 .250 15 .200 32 .200 28 .250 15 .200 32 .200 18 .250 15 .250 20 .250 .250 15 .250 20 .250 .250 15 .250 .250 .250 15 .250 .250 .250 15 .250 .250 .250 15 .250 .250 .250 16 .250 .250 .250 17 .250 .250 .250 18 .250 .250 18 .250 .250 18 .250 .250 .250 18 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 18 .250 .250 .250 .250 18 .250 .250 .250 .250 .250	_	EL TA	٥		DELTA	SAMPLE	DELTA
100 153 .100 134 .100 134 .100 136 .150 .150 .150 .150 .150 .150 .150 .150	0 .100 153 .100 134 .100 0 .150 68 .150 60 .150 4 .250 24 .250 21 .250 8 .250 24 .250 21 .250 ALPHA F .150 ALPHA R .200 ALPHA R .200 0 ALPHA F .150 ALPHA R .200 ALPHA R .200 150 150 130 .100 113 .100 150 32 .250 28 .250 450 250 25 .250 150 250 25 .250 150 250 25 .250 150 180 .250 28 .250 150 180 .250 28 .250	0 .100 153 .100 134 .100 0 .150 68 .150 60 .150 0 .250 24 .250 31 .250 0 .250 24 .250 21 .250 0 ALPHA = .150 ALPHA = .200 0 ALPHA = .150 ALPHA = .200 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 153 100 134 100 134 100 134 100 134 100 136 150 150 150 150 150 150 150 150 150 150	0 153 100 134 100 134 100 134 100 134 100 136 150 150 150 150 150 150 150 150 150 150	0 100 153 100 134 100 134 100 136 150 150 150 150 150 150 150 150 150 150	0 100 153 100 134 100 134 100 136 150 150 150 150 150 150 150 150 150 150	-	-		-	050	536	050
4 . 250 39 . 250 31 . 250 8 .	4 .250 38 .250 33 .250 8 .250 24 .250 33 .250 8 .250 24 .250 21 .250 ***ASO PRUBABILITY OF TYPE II ERRUR (BETA) *** .200 ***ALPHA ***ISO ALPHA *** .200 ***ALPHA ***ISO ALPHA *** .200 ***ASO S2U .050 450 .050 ***ASO S2U .050 113 .100 ***ASO PRUBABILITY OF TYPE II ERRUR (BETA) *** .250 ***ASO PRUBABILITY OF TYPE II ERRUR (BETA) *** .250	4250 39 .250 31 .250 33 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 31 .250 32 .250 32 .250 32 .250 32 .250 32 .250 32 .250 32 .250 32 .250 32 .250 32 .250 32 .250 31 .25	4 .250 38 .250 37 .250 37 .250 8 .250 21 .250 8 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 25 .250 2	4 .250 38 .250 37 .250 8 .250 24 .250 37 .250 8 .250 24 .250 21 .250 8 .250 24 .250 21 .250 ALPHA = .150 ALPHA = .200 ALPHA = .200 13 .200 ALPHA = .200 13 .100 130 .100 130 .100 15 .150 32 .200 28 .200 15 .250 20 .250 28 .250 15 .250 20 .250 28 .250 15 .250 20 .250 28 .250 16 .250 20 .250 28 .250 17 .250 20 .250 28 .250 18 .250 .250 .250 .250 18 .250 .250 .250 .250 18 .250 .250 .250 .250	4 .250 39 .250 31 .250 31 .250 4 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 21 .250 22 .250	4 . 250 39 . 250 31 . 250 8 . 250 24 . 250 21 . 250 8 . 250 24 . 250 21 . 250 8 . 250 24 . 250 21 . 250 10 ALPHA = .150 ALPHA = .200 ALPHA = .200 10 ALPHA = .150					100	134	100
## 450	## 450	### 450	### 1550 24 .250 21 .250 #### 250 24 .250 21 .250 ###################################	8 .250 24 .250 21 .250 2	## - 250	## - 250					.200	33	200
- 450 PRUBABILITY OF TYPE II ERRUR (BETA) = .200 ALPHA = .150 ALPHA = .200 ALPHA = .200 T SAMPLE DELTA SAMPLE DELTA500 T 0.050 5.20 0.50 5.0 T 0.00 130 0.100 5.0 T 0.00 3.2 0.200 2.8 0.200	- 450 PRUBABILITY OF TYPE II ERRUR (BETA) = .200 ALPHA = .150 ALPHA = .200 ALPHA = .200 T	- 450 PRUBABILITY OF TYPE II ERRUR (BETA) = .200 ALPHA = .150 ALPHA = .200 ALPHA = .250	- 450 PRUBABILITY OF TYPE II ERRUR (BETA) = .200 ALPHA = .200	- 450 PRUBABILITY OF TYPE II ERRUR (BETA) = .200 ALPHA = .250	- 450 PRUBABILITY OF TYPE II ERRUR (BETA) = .200 ALPHA = .250	- 450 PRUBABILITY OF TYPE II ERRUR (BETA) = .200 ALPHA = .150 ALPHA = .200 ALPHA = .200 T	-	-	-		.250	21	.250
SAMPLE DELTA 517 .050 .050 .050 .100 .100 .100 .150 .50 .250 .250 .250 .28 .200 .250 .28 .200 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .200 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .28 .200 .250 .200 .200 .200 .200 .200 .200	PHA = .100 ALPHA £ .150 ALPHA = .200 ALPHA = .250 ALPHA = .250 ALL A SAMPLE DELTA SAMPLE DELLA SAMPLE DELTA SAMPLE DELTA SAMPLE DELLA SAMPLE DELTA SAMPLE DELLA S	PHA = .100 ALPHA = .150 ALPHA = .200 ALPHA = .250 ALPHA =	PHA = .100 ALPHA £ .150 ALPHA = .200 ALPHA = .200 TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA .050 450 .050 .050 .050 .050 .050 .050	PHA = .100 ALPHA = .150 ALPHA = .200 ALPHA = .200 TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA .050 450 .050 .050 .050 .050 .050 .050	PHA = .100 ALPHA = .150 ALPHA = .200 ALPHA = .200 TA SAMPLE DELTA .050 .050 .050 .050 .050 .050 .050 .05	PHA = .100 ALPHA = .150 ALPHA = .200 ALPHA = .200 TA SAMPLE DELTA .050 .050 .050 .050 .050 .050 .050 .05	TX-G		1	PRUBABILITY	DE TYPE 11	RRUR (BETA	200
SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 617 -050 520 -050 450 .050 155 -100 130 .100 113 .100 69 -150 58 .150 50 .150	TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 50 617 .050 520 .050 450 .050 50 155 .100 133 .100 50 38 .200 32 .200 28 .200 50 24 .250 20 20 .250 50 00 38 .250 20 .250 .250	TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 50	50 517 5AMPLE DELTA SAMPLE DELTA SAMPLE DELTA 50 520 .050 450 .050 50 155 .150 13 .150 50 38 .200 32 .200 28 .200 50 24 .250 20 .250 18 .250 50 00 34 .250 20 .250 28 .250 50 PHA = .150 PRUBBABILITY OF TYPE II ERROR (BETA) = .250 50 ALPHA = .150 ALPHA = .150	TA SAMPLE DELTA SAMPLE DELTA DELTA 50 617 .050 .050 .050 50 157 .000 .13 .050 50 159 .150 .150 .150 50 38 .200 32 .200 28 50 24 .250 29 .250 .250 50 24 .250 .250 .250 .250 DHA = .100 ALPHA = .250 ALPHA = .250 ALPHA = .250 50 534 .050 382 .050 534 .050 382 .050 534 .050 382 .050	TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 50 617 .050 520 .050 450 .050 50 155 .100 130 .100 113 .100 50 38 .200 32 .200 28 .200 50 24 .250 20 .250 18 .250 CCCURANCE = .450 PRÜBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .150 ALPHA = .150 ALPHA = .200 ALPHA = .250 TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 50 536 .050 446 .100 94 .100 94 .100	TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 50 617 .050 520 .050 450 .050 155 .100 130 .100 133 .100 50 38 .200 32 .200 28 .200 50 24 .250 20 .250 18 .250 CCCURANCE = .450 PRÜBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .150 ALPHA = .150 ALPHA = .250 ALPHA = .250 TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 50 536 .465 .100 382 .050 50 134 .100 112 .100 43 .150 50 134 .150 115	i			A s	ALPHA	.200	ALPHA =
155 . 100 130 . 100 113 . 100 115 . 150 .	50 517 .050 520 .050 450 .050 00 155 .100 130 .100 50 69 .150 50 .200 50 38 .200 32 .200 28 .200 50 24 .250 20 .250 18 .250 00.00000000000000000000000000000000	50 617 .050 523 .055 450 .050 00 155 .100 130 .100 113 .100 00 38 .200 38 .200 28 .200 50 24 .250 23 .250 18 .250 00CCURANCE = .450 PRQBABILITY OF TYPE II ERROR (BETA) = .250	50 517 .050 520 .050 450 .050 .050 .050 .050 .050 .050	50 517 .050 520 .050 450 .050 .050 .050 .050 .050 .050	50 517 .050 520 .050 450 .050 .050 .050 .050 .050 .050	50 517 .050 520 .050 450 .050 .050 .050 .050 .050 .050			۵	S	DELTA	SAMPLE	DELTA
155 .100 130 .150 .150 .150 .150 .150 .150 .150 .15	50 155 -100 130 -100 113 -100 150 00	50 155 1100 130 1100 113 1100 150 50 50 150 50 50 50 50 50 50 50 50 50 50 50 50 5	00 155 1100 113 1100 115 115	00 155 100 130 110 110 110 110 110 110 110 110	50 155 100 130 113 1100 113 1100 115 11	50 155 100 130 113 1100 113 1100 115 1100					050	450	050
38 . 200 32 . 200 28 . 200	00 38 .200 32 .200 28 .200 50 24 .250 20 .250 18 .250 CCCURANCE = .450 PRUBABILITY OF TYPE II ERROR (BETA) = .250	00 38 .200 32 .200 28 .200 50 24 .250 25 .250 18 .250 CCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250	00 38 .200 32 .200 28 .200 50 24 .250 23 .250 18 .250 CCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .100 ALPHA = .150 ALPHA = .200 ALPHA =	00 38 .200 32 .200 28 .200 50 24 .250 20 20 28 .200 CCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .100 ALPHA = .150 ALPHA = .200 ALPHA = .250 TA SAMPLE DELTA SAMPLE DELTA DELTA CALC	00 38 .200 32 .200 28 .200 50 24 .250 20 .250 18 .250 CCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .150 ALPHA = .150 ALPHA = .200 ALPHA = .200 TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA .250 134 .150 .150 .150 .150 .150 .150 .150 .150	00 38 .200 32 .200 28 .200 50 24 .250 20 .250 18 .250 CCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .150 ALPHA = .150 ALPHA = .250 TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 50 536 .150 445 .050 382 .050 50 134 .150 112 .100 43 .150						113	001.
20 250 30	50 24 .250 .250 .250 .250 .050 CCCURANCE = .450 PRUBABILITY OF TYPE II ERROR (BETA) = .250	50 24 -250 23 -250 18 -250 0000 0000 0000 0000 0000 0000 0000	SO 24 -250 23 .250 18 .250 GCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .100 ALPHA = .150 ALPHA = .200 ALPHA = .200	SO 24 -250 20 -250 18 -250 CCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .100 ALPHA = .150 ALPHA = .200 ALPHA = .200 TA SAMPLE DELTA SAMPLE DELTA DELTA .050	SO 24 -250 20 .250 18 .250 GCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .150 ALPHA = .150 ALPHA = .200 ALPHA = .200 TA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA .250 50 536 .465 .100 94 .100	SO 24 -250 20 .250 18 .250 GCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .150 ALPHA = .150 ALPHA = .200 ALPHA = .200 TA SAMPLE DELTA SAMPL					200	28	.200
007	OCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) =	OCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250	OCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .130 ALPHA = .153 ALPHA = .250 ALPHA = .250	GCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETAL) = .250 PHA = .150 ALPHA = .150 ALPHA = .250 PHA = .150 ALPHA = .250 ALPHA = .250 ANPLE DELTA SAMPLE DELTA S	CCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .150 ALPHA = .150 ALPHA = .150 ALPHA = .250 ALPHA = .250 ALPHA	CCCURANCE = .450 PROBABILITY OF TYPE II ERROR (BETA) = .250 PHA = .150 ALPHA = .150 ALPHA = .150 ALPHA = .250 ALPHA = .150 ALPHA = .250 ALPHA = .150 ALPHA = .250 ALPHA = .250 ALPHA	-	-	•	-	.250	18	.250
SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 536 .050 382 .050 382 .050 382 .100 112 .100 96 .100 60 .150 53 .200 28 .200 24 .200	SAMPLE DELTA SAMPLE DELTA SAMPLE DELTA 536 .050 .446 .050 .382 .050 134 .100 .112 .100 .96 .100 60 .150 .250 .250 28 .200 .24 .200	536	134 .100 112 .100 96 .100 60 .150 50 .150 43 .150 32 .200 28 .200 24 .200	32 . 200 . 28 . 200 . 24 200	32 .200 28 .200 24 .200								0000

SAMPLE SIZE (W) FOR A GIVER VALUE OF MACNITUDE (OELTA), WITH A SPECIFIC PROBABILITY OF A TYPE 1 ERROR (ALPHA) FOR

V T	050	AL PHA	- 100	ALPHA	=150	ALPHA	200	ALPHA	250
	SAMPLE	6FL TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
000	12.15	2000	6101	060.		000.	500	000.	60.
071.	175	201.	197	100	682	001.	217	001.	193
2.0	17	200	774	000	103	200	5.5	000	67
25.5	40	250	0.4	052.	35	.250	32	-250	59
	PROBABILI	1 y 0.F			RUBABILITY O	F TYPE 11	ERRUR (BETA	-	
TH DHA	050	AL PHA	- 100	ALPHA	- 150	ALPHA	- 200	ALPHA	- 250
	-	DEL TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DEL TA	SAMPLE
050	1048	050		050	739	.050	656	050	5 90
.100	260	.100	212	.100	183	.100	163	.100	146
.150	114	150	93	.150	83	150	7.1	.150	99
.200	63	.200	51	. 200	7,7	.200	39	.200	35
-250	3.9	.250	32	.250	28	.250	24	.250	- 22
ALPHA =	650	AL PHA	001.	ALPHA	- 150	ALPHA	200	ALPHA	250
		AL PHA	- 100	ALPHA	- 150	ALPHA	• .200	AL PHA	250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
200	233	-	. 20	000		000	133		
150	777	.100	1,0	001.	751	001.	133	.100	110
200	54	200	43	. 200	37	200	32	200	58
.250	33	.250	17	.250	23	-250	20	.250	18
	PROBABILIT	IN DE DECURANCE	RANCE .	500 PR	PROBABILITY D	DE TYPE 11	ERROR LBETA	A)200	
ALP HA =	.050	AL PHA	100	ALPHA	150	ALPHA	200	ALPHA	. 250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050	783	.050	617	.050	520	.050	450	.050	396
.100	194	.100	153	.100	129	.100	112	.100	86
150	85	951	1	150	- 25	051	64	150	43
.200	15	.200	37	. 200	31	002.	27	.200	54
.250	50	.250	73	.250	13	-250	17	.250	15
	PREBABILIT	TY OF DECURANCE		.500 PR	PROBABILITY O	OF TYPE 11	ERROR (BETA)	A) = .250	
ALPH1 =	- 1	AL PHA	- 100	ALPHA	=153	ALPHA	200	ALPHA	250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
0.50	769	050	536	050	995	•050	382	.050	332
.100	172	.100	133	.100	111	.100	9.6	.100	83
150	7.5	.150	58	051	64	.150	42	.150	36
002.	4.1	.200	32	. 200	7.2	.200	53	.230	20
0									

SAMPLE SIZE (1) FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT SAMPLE SIZE (1) FOR A GIVEN VALUE OF MAGNITUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

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250	SAMPLE	179	195	86	8,4	30		250	SAMPLE	2 90	148	99	37	- 23		250	SAMPLE	422	1 20	53	30	19	-	250	SAMPLE	396	66	35	C ±		250	SAMPLE	335	83	37
ALPHA :	DELTA	050	100	150	.200	.250	.100	ALPHA	DELTA	.050	.100	.150	.200	.250	150	ALPHA	DELTA	050	.100	150	.200	.250	1200	ALP HA :	DELTA	050	.100	300	0020		ALPHA	DELTA	050	.100	
.200	SAMPLE	854	214	50	53	33	ERROR (BETA)	200	SAMPLE	656	164	73	4.1	92	ERRUR (BETA)	.200	SAMPLE	536	134	09	33	21	RRUR (BETA)		SAMPLE	450	113	200	97	ERROR (BETA)	.200	SAMPLE	382	96	43
ALPHA =	DELTA	050	100	150	200	.250	TY PE 11	AL PHA =	DELTA	.050	.100	.150	.200	. 250	TYPE 11	ALPHA =	DELTA	050	.100	.150	.200	•250	PROBABILITY OF TYPE II ERRUR	ALPHA =	DELTA	.050	.100	150	250	-	ALPHA =	DELTA	.050	.100	.150
.153	SAMPLE	675	238	105	53	37	ROBABILITY OF	150	SAMPLE	139	185	82	94	29	PRUBABILITY OF	.150	SAMPLE	612	153	68	38	77	BABILITY OF	.150	SAMPLE	520	130	88	35	7	.153	SAMPLE	645	112	50
ALPHA =	DELTA	050	100	150	. 200	.250	٩	ALPHA =	DELTA	.050	.100	.150	.200	.250		ALPHA =	DELTA	050	.100	.150	. 200	. 250		ALPHA .	DELTA	050	.100	150	25.0	550 PRU	ALPHA =	DELTA	050	.100	.150
.100	SAMPLE	1679	273	120	67	45	A4CE = .550	100	SAMPLE	854	214	9.5	53	. 33	ANCE = .550	.100	SAMPLE	717	180	80	55	89	ANCE 550	001	SAMPLE	617	155	696	36		001	SAMPLE	536	134	3
AL PHA =	DELTA	050	.100	1.50	.200	.250	IY OF DECURANCE	AL PHA =	DELTA	.050	.100	.150	.200	.250	IY UF BECURANCE	AL PHA =	DELTA	050	.100	.150	.200	-250	PRUBABILITY OF DCCURANCE	AL PHA =	DELTA	250.	.100	150	250	IY UF OCCURANCE	AL PHA =	DELTA	050	.100	.150
.050	SAMPLE	1296	324	143	0.00	50	PRUBABIL ITY	050	SAMPLE	1048	262	116	6.5	- 41	PREBABILITY U	.050	SAMPLE	808	524	66	55	35	PRUBABILIT	050	SAMPLE	783	196	87	0 0	PRUBARILITY UF		SAMPLE	269	173	11
ALPHA =	OFL TA	050	100	150	200	.250		AL PHA	DELTA	050	.100	.150	200.	-250		ALPHA =	DELTA	-050	.100	.150	.200	-250		ALP HA =	DELTA	050	.130	150	002.		- 44 7 Ha =	DELTA	0 < 0 -	.100	.150

27.

SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT

	750. =	AL PHA	100	ALPHA	.150	ALPHA =	.200	ALPHA =	.250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
350.	1270	030.	1058	050.	930	050.	837	050	163
301.	321	.100	267	.100	235	.100	212	.100	193
051	143	.156	120	150	105	.150	6.5	.150	98
.200	81	.200	19	. 200	53	.200	53	.200	55
.250	15	.250	43	.250	38	.250	34	.250	31
	PRUSABILITY	TY OF BECURANCE		.600 PR	PREBABILITY OF	TYPE 11	ERRUR (BETA	001100	
at P Fin =		At Prite	- 661.	AHATA	-150	ALPHA =	. 500	ALPHA =	.250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050	1027	.050	837	.050	724	050	643	050	578
.100	260	001.	212	.100	183	.100	163	.100	146
150	116	.150	9.5	150	8.2	.150	73	.150	99
.200	99	.200	53	.200	45	.200	4.1	.200	37
	PRUBABILITY	TY OF CCCURANCE		.600 PRC	PREBABILITY D	_	ERROR (BETA	. 150	
ALP HA =	050	AL PHA =	001	ALPHA =	. 150	ALPHA =	• 200	ALPHA .	.256
DELTA	SAMPLE	DEL TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
750	- \$77	050	702	050	505	050	525	050	46
001.	222	.100	178	.100	152	.100	133	.100	118
150	66	.150	60	.150	89	.150	09	.150	5.5
.200	56	200	45	. 200	38	.200	34	.200	30
	PROBABILITY	=		0	ž	_	FRRUR (RETA	1 = .200	
E AH Q IA	- 050		00	AHQIA		AHO IA	200	AI PHA	250
	S	DEL TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	767	0.50	605	050	509	.050	441	.050	388
.100	194	.100	153	.100	123	.100	112	.100	86
300	187	250	54	000	258	051	000	051	14
250	31	250	25	250	21	250	81	250	16
	PRUSABILITY	43		.600 PRO	PROBABILITY OF	TYPE 11	ERROR (BETA	•	
# AHGJH		AL PAA =	100	ALPHA	153	ALPHA =	.200	ALP HA .	.250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	673	.350	526	050	437	.050	374	050	325
.100	172	100	133	.100	111	.100	66	001.	83
120		351.	79	061.	25		43	061.	31
13117									

SEAPLE SIZES FOR PAIRED AVALVESS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT

	-		ALPHA	153	ALPHA	200	ALPHA =	.250
LIA SAMPLE		SAVPLE	DE L 1 A	SAMPLE	DELTA	SAMPLE	DELTA	SAMPL
-			.050	260	.050	803	050.	732
			. 100	228	.100	502	.100	187
.150 140			. 150	103	.150	63	150	8.5
			. 200	65	007	53	002.	4.8
.250 51	.250		.250	38	.250	34	.250	31
PROBA	PRUBABILITY OF OCCURANC		.650 PR	RUBABILITY D	DF TYPE 11	FRROR (BETA	.100	
41 P HA = .050			ALPHA	150	ALPHA	. 200	ALP HA =	.250
S		,	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPL
			.050	769	.050	616	.050	554
.100 252		205	.100	178	.100	158	.100	142
			.150	08	.150	11	.150	99
			.200	46	.200	4.1	.200	37
.250 42	250	1	.250	23	.250	56	.250	54
ALPHA = .050		"		- 150	AL PHA	- 200	ALPHA .	.250
				SAMPI F	DEL TA	CAMPIF	DELTA	SAMPI
050 841			1	\$15	050	204	050	448
	.100	172	.100	147	.100	129	.100	115
		-		67	.150	5.8	.150	52
				38	.200	33	.200	30
250 36				24	.250	21	.250	19
PROBL	PROBABILITY OF OCC	GCCURANCE =	980	PROBABILITY	F. TYPE. 11.	ERROR (BETA	A1200	
ALP HA : .050			-	150	ALPHA	200	ALPHA .	.250
SA	E DELTA		DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050		-		400	.050	423	050	372
7				125	.100	108	.100	95
-		1	1	- 51	150	64	150	43
				35	.200	87	.200	\$2
ARLA9	BILITY	3 .	9 053	2		ERROR (BETA	1	
- 200		,			9	200	410	36
	P. DELTA	S I dr. A S	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPI
050		•	050	419	050	350	050	312
			100	107	100	65	100	80
			150	65	.150	45	.150	36
			200	38	200	2.6		

SAMPLE SIESS FOR PAIRED ANALYSIS HERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT (ALPHA) FOR (A) FOR A GIVEM VALUE OF MAGNITUDE (DELTA), MITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR .250 SAMPLE 685 177 177 47 47 .250 SAMPLE 519 134 .250 SAMPLE 419 109 50 29 29 .250 SAMPLE 348 90 41 24 33 ALPHA DELTA .050 .100 .150 ALPHA DELTA .050 .100 .250 .150 ALPHA DELTA 050 .150 .200 ALPHA .050 .100 .250 PREBABILITY BE TYPE II ERROR (BETA) = .050 -- 500 FRRUR (BETA) ERROR (BET ERROR 18E .200 SAMPLE 751 194 .89 .51 .200 SAMPLE 577 149 68 39 26 .200 SAMPLE 471 122 122 56 32 .200 SAMPLE 396 103 47 27 27 ALPHA DELTA .050 .100 .200 ALPHA DELTA .050 .100 .150 TYPE 11 ALPHA DELTA .050 .100 .150 .250 ALPHA DELTA 050 .100 .250 TYPE 11 TYPE 11 PROBABILITY 250 235 216 216 27 PRUBABILITY PROBABILITY .153 SAMPL E 650 168 17 77 44 .150 SAMPLE 457 118 54 54 31 SAMPL 538 139 664 37 24 ALPHA DFLTA .050 .100 .200 ALPHA DELTA 050 .100 .200 .250 ALPHA DELTA .050 .100 .150 ALPHA DELTA 050 .100 .200 002. -700 .160 SAMPLE 751 194 39 51 .100 630 163 75 43 28 544PLE 543 141 141 24 .100 SAMPLE 249 246 112 64 PRINKAPILITY OF OCCURANCE = UF GCCURANCE = DE DECURANCE . UF SCCURANCE -AL PHA ... 050 ... 150 ... 250 ... 250 AL PHA DEL TA .050 .100 .150 AL PHA DEL TA 050 .100 .200 PRUBARILITY PROBLEMILTY PRUBABIL .050-SAMPLE 113° 295 295 1335 177 .050 SAMPLE 922 238 109 63 .050 SANPLE 787 204 93 54 35 .050 5AHPLE 689 178 178 47 47 DEL TA 050 .150 .150 .250 ALPHA DELTA 050 .100 .200 ALPHA DELTA .050 .100 .200

. . .

SAMPLE 292

ERRUR (BETA)

TYPE 11

36

PROBABILITY

.700

OF OCCURANCE .

PRUBABILITY

ALPHA DELTA .050 .100 .150

.200 SAMPLE 336 87 40 23

ALPHA DELTA .050 .100 .150

.153 SAMPLE 392 102 47 27

ALPHA 0ELTA 050 100 150 250

.103 SAMPLE 472 172 122 56 32 21

DELTA DELTA DSC .100 .200 .200

.056. SAMPLE 6.03 158 72 41

DELTA 050 .100 .200 STAPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT PARDID FAIRHAD FOR

4	050	AL PHA =	001.	ALPHA	153	ALPHA =	.200	ALPHA =	.250
PELTA	SAMPLE	DELTA	SANPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLI
050	1035	350.	362	040	158	050.	682	050	622
.100	27.5	.100	526	.100	163	001.	179	.100	164
150	126	150	105	150	26	.150	63	150	16
302.	7.3	.200	61	. 200	54	.200	4.8	.200	77
.250	1	.250	04	.250	35	.250	32	.250	59
	PRUBARILITY	TY OF DECURANC		.750 PR	RUBABILITY OF	17 PE 11	ERROR (BETA	A) 100	
H P H	050	AL PINA -		ALPHA	- 150		. 200	ALP HA =	250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	837	050	682	050	593	050	524	050*	471
.100	250	.100	179	.100	155	.100	138	.100	154
.150.	102	.150	83	.150	72	.150	79	.150	57
.230	65	200.	8 7 6	. 200	45	.200	37	200	33
	rangaeri i i		, ,	VIOLV OCC.	בי יבי	1 1 1	200 COC -		260
t	2000	1 1 1 1 1 1 1	20745	A T 1 3 C	CAMPI		٠	DELT A	CAMOI
	715	0.50	573	050	227	050	438	040	201
100	188	100	150	100	128	100	113	100	100
.150	87.	.150	70	.150	63	.150	52	.150	4.7
.200	51	•500	41	. 200	35	•500	30	.200	72
.250	33 DRUBLETT 11V	1	- 12	. 250 . 750 PP	>	-	20 FRROR (RETA		18
OH O	-050	1	00	4		AI PHA			05.7
1	S	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	623	.050	493	.050	415	.050	360	050	316
.100	164	.100	130	.100	103	.100	9.5	.100	83
150	76	150	09	150	51	150	99	150	39
250	5 6	250	23	. 250	6.	250	17	250	15
	PREBABILITY	-		-	ROBABILITY DF	TYPE 11	ERROR (BETA	•	
ALE HA	= .405.1	AL PHA =	100	ALPHA	150	ALPHA =	200	ALPHA =	250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	553	050	429	050	356	.050	305	050	592
.100	145	.100	113	.100	56	100	08	.100	25
156	67	.150	- 52	150	55	.150	3.1	חכוי	. 33
200	.,,,							,	

SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT SAMPLE SIZE (4) FOR A SIVEN VALUE OF MAGNITUDE (OPLIA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

DELTA SA	.050	AL PhA	001.	ALPHA		ALPAA =	.200	ALPHA =	.250
	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
040.	506	050	753	.050	062	.050	965	050	244
.100	245	.100	202	.100	177	.100	160	.100	146
-150	114	.150	54		83	.150	75	.150	69
.200	67	.200	56	. 200	65	.203	75	.200	04
057.	5.4	-250	37	.250	33	.250	30	.250	27
à	PRUBABILITY	T UF UCCURANCE		.8G0 PR	PRUSABILITY O	F TYFE 11	ERRUR (BETA	100	
ALP HA =	0.50	AL PHA	100	ALPHA	-150	AL PHA =	200	AI PHA	250
	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPL
	732	050	969	050	516	050	458	050	412
.100	196	.100	160	.100	138	.100	123	.100	110
.150	65	.150	15	.150	65	.150	58	.150	52
.200	54	.200	55	. 200	38	.200	34	.200	31
250	36	.250	30	. 550	97	.250	- 53	.250	21
ā	PRUBARILITY	I DE DECURANCE		.800 PR	PRUBABILITY OF	F TYPE 11 E	TYPE II ERROR (BETA	1 = .150	
ALP HA =	.050	AL PHA	100	ALPHA	150	ALPHA	.200	ALPHA -	.250
	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	625	050	200	050	427	050	374	050	333
.100	167	.100	134	.100	114	.100	100	.100	88
150	- 65	.150	63	150	24	.150	4.1	.150	45
.200	46	.200	37	. 200	35	.200	88	.200	52
	31		52	. 250	72	.250	61		11
	PROBABILITY		4	.800 P.R.	PRUBABILITY OF TYPE IL ERROR	F IYPE II E	RRUR (BETA	1 = .200	
	.050	AL PHA =	100	ALPHA	150	ALPHA =	.200	ALPHA .	.250
DELTA SA	SAMPLE	DEL TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050	247	.050	431	.050	363	050	314	•050	277
.100	146	.100	115	.100	16	.100	84	.100	74
150	69	150	5.4	150	44	150	04	150	35
.200	41	907	35	. 200	2.7	.200	54	.200	21
.250	-27	250	21	-250	18	.250	16	.250	14
5d	PRUBABILITY	OF DECURANCE	"	.800 PR	PRUBABILITY OF	TYPE 11	ERRUR (BETA		
4	.05.1	ALPHA	001	ALPHA		ALPHA	.200	ALPHA =	250
DELTA SA	SAMPLE	DELTA	SAHPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	483	.050	375	050	311	.050	267	050	232
.100	129	.100	100	.100	98	.100	72	.100	29
.150	61	.150	47	.150	33	.150	34	.150	53
.200	36	.200	28	200	23	200	00	200	4
				003.	2	201	2	003.	•

SAMPLE SIZE (N) FOR A SIVER VALUE OF MAGNITUDE (DELIA), MITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

*	S		154	-	36			"	5.		76			-	0	*	SAMPLE	1	92	-	22:		4 = .250	٠				18	-	0	1	SAMPLE	-		
ALPHA	DELTA	050	.100	150	.200	.250	A) = .100	ALPHA	DELTA	0 50.	.100	.150	.200	-250	A)150	ALPH	DELTA	050	.130	150	002.	_	ALDHA	DELTA	050	.100	150	.200	-250	A) = .250	ALPHA	DELTA	-050	001.	2011
200	SAMPLE	665	136	59	39	56	ERRUR (BETA	900	SAMPLE	378	104	90	30	70	ERRUR (BETA)	200	SAMPLE	308	8 5	41	52	ERROR (BETA	200	CAMDIE	260	72	35	21	14	ERROR (BET	200	SAMPLE	220	100	6.3
ALPHA	DELTA	050.	.100	-150	.200	.250	F TYPE 11	AHPHA	DELTA	.050	.100	.150	•500	.250	F TYPE 11	ALPHA	DELTA	050	.100	.150	200	IYPE 11	AI PHA	DELTA	050	.100	.150	.200	.250	F TYPE 11	ALPHA	DELTA	.050	001.	0011
153	SAMPLE	548	151	72	43	53	PROBABILITY D	150	SAMPLE	426	117	56	34	- 23	RUBABILITY D	150	SAMPLE	353	16	7.7	8 6	PROBABILITY DE	1.50	S AMDI E	300	83	04	5.4	16	ROBABILITY D		SAMPLE	257	7.7	•••
ALPHA	DELTA	050.	.100	.150	.200	.250	.850 PR	AL PHA	DELTA	050	.100	.150	. 200	.250	d0	ALPHA	DELTA	050	.100	150	. 200	850 PR	AI PHA	DELTA	020	.100	150	.200	.250	.850 PR	ALPHA	DELTA	050	. 100	1011
- 100	SAMPLE	623	171	- 82	64	33	OCCURANCE = .8	100	SAMPLE	493	136	65	39	26	RANCE = .85	001.	SAMPLE	414	114	55	33		0	CAMBIE	356	85	47	88	19	OCCURANCE = .8	- 100	SAMPLE	310	92	7.5
AL PHA	DELTA	050	.100	150	.205	.250	9	All PHA	DELTA	050	.100	.150	.200	.250	TY DE CCCURANCE	ALPHA	DEL TA	050	.100	.150	.200	2		A 1 1 2 C	050	100	150	.200	.250	90	AL PHA	DELTA	350	.100	0010
	SAMPLE	746	505	66	5.5	04	PRUBABILITY	050	S	609	166	80	43	32.	PRUBABILITY		SAMPLE	516	145	68	41	PRUBABILITY	.050	-	452	124	- 60	36	24	PROBABILITY	050.	SAMPLE	366	011	2.
ALP HA =	NELTA	050	.100	051	.200	.250		21 P H3. 2		050	.100	.150	.200	.250		ALPHA	DELTA	050	.100	150	.200		AI PHA		0.50	.100	150	.200	.250		ALPHA	DFLTA	050	001.	7010

SAMPLE SIZE AS PERRED NAMER'NSIS SHERE THE SIGN OF THE DIFFCRENCE IS NOT IMPORTANT SAMPLE SIZE AS ALVER DE MAGNITURE FORLALLITY OF TYPE II ERROR (BETAL 1 . 050 ALPHA	JR (ALPHA)	.250 SAMPLE 339	94 96 17	250	SAMPLE	22	53	250	SAMPLE	90	22		SAMPLE	50	222		SAMPLE	145	13	•
SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT BECAUSE IN THE A SPECIFIC FALBBILLING CONTRACT. 100 1	TANT IYPE I	ALP DELT	.100 .200 .250		DELTA .050	.100	200	1	DELTA	.100	.250	1	DELTA	.100	250	.250	ELTA	1	1	250
SAWPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF PROBABILITY DE OCCURANCE = 900 PROBABEL ALPHA = .050 ALPHA = .100 ALPHA = .15 150 564 .300 135 150 162 .100 135 150 49 .200 41 .200 250 49 .200 41 .200 250 49 .200 41 .200 250 24 .250 28 .250 250 49 .200 41 .200 250 28 .250 28 250 40 .200 33 .200 250 40 .200 33 .200 250 40 .200 33 .200 250 40 .200 33 .200 250 28 .200 28 250 28 .200 20 250 28 .200 20 250 38 .200 20 260 20 20 270 20 20 28 .200 20 28 .200 20 28 .200 20 28 .200 20 28 .200 20 28 .200		Oan	107 53 33 23		SAMPLE 285	8 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	25	(8E1	SAMPLE	67	223		SAMPLE	196	71	g .	SAMPLE	166	24	10
SAWPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF SIZE (13) FOR A GIVEN VALUE OF MACALITUDE DELITA, AITH A ALPHA = .050 ALPHA = .050 ALPHA = .050 ALPHA = .100 ALPHA = .050	FFERENCE I	ALPHA DELTA	.150	TYPE 11	40	.100	.200	TYPE 11	DELTA	.100	200			.100	200	TYPE 11		.100	.200	250
ALPHA = .050 AL	- q .	150 AMPL E 413	1119 25 25	SABILITY OF	SAMPL E	92	588		AMPL	7.7	24 16	BABILLTY OF	ANPL	226	20	0	ANPL	56	28	127
SAMPLE SIZES FOR PAIRED ANALYSIS WH JIE 4MJ FOR A GIVEN VALUE DE MACAIIUDE ALPHA = .050 ALPHA = .	RE THE SIGN (DELIA), M	ALPH DELTA 050	150	0 AH914	DELTA 050	.100	.200	ALBIA	DELTA	.100	250		DELTA	. 100	250		4 4	.100	200	250
SAWPLE SIZES FOR PAIRE IN E CA & GIVEN VALUE PROBABILITY OF OCCUPANTE OCCUPA	SIS WH	20 20 20	135	. 00	A MPL	107		. 00	SAMPLE	96	28		. 4	269	24		. 4	234	33	4
ALPHA = DELTA 150 15	PAIRE	DEP.	2 50	40		.100	200	NE NE	DELTA	100	250	4		050	2 00	4	DELTA	.100	2,00	250
112 PAPE	E S12FS FD FOR A GIVE	050 SAMPLE 564	162 94 94	PROBABILIT	SAMPLE	131	040	PRUBABILII	SAMPLE	112	34	PROBABILIT	SAMPLE	341	30	PROBABILIT	SAMPLE	301	27	18
	3710	ALPHA = DELTA .050	250	44	DELTA 050	.100	.200	41.0	DELTA	.100	200		DELTA	.100	.200		DELTA	.100	200	250

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SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS NOT IMPORTANT SAMPLE SIZE (N) FOR A SIVEN VALUE OF MAGNATUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

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ALPHA = .200	SAMPLE DELTA SAMPLE DELTA	25.7	001.	000	002.	062. 81 062. 61	950 PRUBABILITY OF TYPE II ERROR (BETA) = .100	ALPHA 2 150 ALPHA = .200 ALPHA = .250	SAMPLE DELTA SAMPLE DELTA S	050. 178 .050	63 .100 56 .100	33 .150 29	5 . 250 19 . 250	O PRUBABILITY OF TYPE II ERRUR (BETA)150	DELTA SAMPLE DELTA SAMPLE DELTA SAMPLE	166 .050 146 .050	52 .100 46	28 .150 .24 .150	.250 18 .250 16 .250 17 .250 10	950 PRUBABILITY OF TYPE 11 ERROR (BEIA) = .200	ALPHA = .150 ALPHA = .200 ALPHA = .250	SAMPLE DELTA SAMPLE DELTA S	141 .050 122 .050 1	34 001. 34 001. 34	15	250 11 .250	950 PRDBABILITY OF TYPE II ERROR (BETA) * .250	ALPHA = .150 ALPHA = .200 ALPHA = .250	E DELTA SAMPLE DELTA SAM	030	060.	38
	TA S	0.50	36 001.	2000	16 002.		UF DCCURANCE = .9	AL PHA = 100	5	050		-	.250 25	UCCURAN	DELTA SAMPLE	050	.100 61	-	250 21	DE OCCURANCE = .9	ALPHA = 100	SA	1	.100	200	250 13	DF DCCURANCE = .9	AL PHA = .100	S			.100 45
	~		017 001.	-		97	PRUBABILITY	ALP HG = .050	0	-		-	.200 30	1	DELTA SAMPLE				250 26	PROBABILITY	ALP HG = .050	SA	7	.100 67			PRUBABILITY	ALPHA = .050	DELTA SAMPLE	188	-	

APPENDIX B

SAMPLE SIZE REQUIRED TO DETECT A DIFFERENCE OF PRESCRIBED MAGNITUDE FROM A STANDARD PROPORTION WHEN THE SIGN OF THE DIFFERENCE IS IMPORTANT

REFERENCE: AMCP 706-111, PARAGRAPH 8-1.5

DATA NOTES

PROBABILITY OF OCCURANCE IS THE KNOWN PROPORTION OF THE POPULATION OF STANDARD ITEMS WHICH EXHIBIT THE PERTINENT CHARACTERISTIC. THIS MAY BE KNOWN FROM THE PROCESS HISTORY, OR MAY BE GIVEN BY THE REQUIREMENTS OF A SPECIFICATION OR A STANDARD

PROBABILITY OF DEVIATION IS COMPUTED AS:

PRUBABILITY OF OCCURANCE PLUS DELTA, IF PROBABILITY OF OCCURANCE IS LESS THAN OR EQUAL TO 0.5 PROBABILITY OF OCCURANCE IS GREATER THAN 0.5

1-8ET 2)+(1-AL PHA EQUATION

WHERE D . (2 X ARCSINE SQUARE ROOT OF PROBABILITY OF DEVIATION) - (2 X ARCSINE SQUARE ROOT OF PROBABILITY OF OCCURANCE)

SAMPLE SIZES FOR PAIRED AVALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMPLE SIZE (N) FOR A GIVEN VALUE OF MAGNITUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

2	SAMPLE	146	95	54	16	11		~	SAMPLE	104	33	11		80		0620	79	25	13	6	•		.250	SAMPLE	63	02:	;-	. 5		N	SAMPLE	20	16	6	•
ALPHA =		050	.130	.150	.200	.250	• .100	ALPHA =		050	•100	.150	• 200	.250				000	150	.200	.250	200	ALPHA .		.050	001.	200	.250	• .250	ALPHA .	_	•050	.100	.150	***
* .200	SAMPLE	167	53	88	18	13	ERROR (BETA)	200	SAMPLE	122	39	50	13	6		007.		30	91	10	∞	ERROR (BETA)	\sim	SAMPLE	77	57	. e	٥٠	ERROR (BETA)	~	SAM	63	50	=	
 ALPHA	DELTA	.050	.100	.150	.200	.250	JF TYPE 11	ALPHA	DELTA	.050	.100	.150	.200	.250		ALTA	050	001	.150	.200	.250	OF TYPE II	ALPHA	DELTA	.050		200	.250	DF TYPE 11	ALPAA	DELTA	050	.100	.150	000
20	SAMPLE	195	61	32	21	15	RUBABILITY	150	SAMPLE	145	94	57	16	=		COND.	116	37	13	13	•	OBABILITY	150	SAMPLE	96	30	20		ROBABILITY	.150	SAMPLE	79	52	13	•
ALPHA	DELTA	.050	.100	.150	. 200	.250	050 PR	ALPHA	DELTA	.050	.100	.150	. 200	.250		ALPHA	050	001	.150	. 200	.250	050 PR	ALPHA	DELTA	.050	.100	200	. 250	.050 PR	a	DELTA	.050	.100	.150	****
- 100	SAMPLE	232	73	38	52	19	URANCE = .		SAMPLE	178	99	53	19	14		. 100 m . 100	•	949	54	16	=	RANCE = .0	•	SAMPLE	122	39	13	•	CCURANCE	100	SAMPLE	104	33	17	
•	TA	.050	.100	2	.200	5	DF DCC	AL PHA	DELTA	.050	0	u 1	0	601	5	AL PHA	250	100	150	•200	.250	ITY OF OCCUR	AL PHA	4	.350	.100	200	.250	0.40	AL PHA	DELTA	050	.100	.150	
050. =	SAMPLE	293	85	4	31	22	PROBABILITY	• .050	SAMPLE	232	73	38	52	18		050.	195	19	32	21	15	PROBABILITY	• .050	SAMPLE	167	53	18	13	PROBABILITY	.050	SAMPLE	146	94	54	
ALP HA	DELTA	.050	.100	.150	.200	.250		AL P HA	DELTA	.050	.100	.150	.200	.250		ALPHA	050	1001	.150	.200	.250		ALPHA	DELTA	.050	001.	200	.250		AL P HA	DELTA	.050	.100	.150	

SAMPLE SIZES FOR PAIRED AVALUE OF MAGNITUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

		111111111111111111111111111111111111111	יו פר מרכטאור		001.	KUSABILITY U	r ivee ii	FREUR (BETA	A)050	
	¥	050	ALPHA =	.100	ALPH	15	_	200	ALPHA	* .250
	DELTA	SAMPLE	4	SAMPLE	DELTA	S	DELTA	SAMPLE	-	SAMPLE
	050	470	050.	372	050.	31	.050	569	.050	234
	.100	135	.100	101	.100	6	.100	77	.130	19
	.150	67	.150	53	.150	4	.150	38	.150	33
	.200	41	.200	33	.200	2	.200	57	.200	21
	.250	28	.250	53	.250	-	.250	16	.250	14
		PROBABILITY	TY OF OCCUR	ANCE =	001.	PRUBABILITY D	F TYPE 11	ERRUR (BETA	A)100	
	ALP HA =	050. =	AL PHA =	•	ALPH	"	•	200	ALPHA	250
	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	S	DELTA	SAMPLE	DELTA	SAMPLE
	.050	372	.050	285	.050	233		_	.050	166
	.100	107	.100	85	.100		.100	57	.100	87
	.150	53	.150	41	.150		.150	8.2	.150	54
	.200	33	.200	52	.200		.200	17	.200	15
	.250	23	.250	17	.250		.250	12	.250	10
	AI DHA	0.50	A A DHA	100	AIDH		AI DHA	000		0.50
		-		CAMDIF	DEL TA				DEI TA	CAMPIE
	0.50	312	0.00		050	187	050	153	050	127
-	100	06	100	67	.100		100	99	100	37
	.150	45	.150	33	.150		.150	22	150	18
-	.200	28	.200	21	. 200		.200	14	.200	11
	•250	19	.250	14	.250	12	.250	10	.250	80
		PROBABILIT	TY OF OCCURANC	*	.100	PROBABILITY O	F TYPE 11	ERROR (BETA	A1200	
	_	• .050	ALPHA -	.100	ALPH	10	-	• .200	ALPHA	250
	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
	050	569	.050	196	. 050	5	.050	123	.050	100
	001.	11	100	57	. 100	55	.100	36	.100	53
	.150	38	.150	E !	051.	~:	.150	2:	.150	2 °
	0020	57	052	12	250	<u> </u>	0020	- «	050	
		PROBABILITY	9	CE =	100	PROBABILITY O	F TYPE 11	-	A) = .250	
	AI P HA	- 050	AI PHA =	100	A I PH		-	- 200	AL PHA	. 250
		S	DELTA	SAMPLE	DELTA	9	DELTA	SAMPLE	DELTA	SAMPLE
	.050	234	.050	166	.050		.050	100	.050	79
-	.100	19	.100	648	.100		.100	67	.100	23
	.150	33	.150	56	.150		.150	15	.150	12
!	.200	21	200	15	200		300	0	200	,
		:	201		003.		002.	•	0000	

SAMPLE SIZES FOR PAIRED AVALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMPLE SIZE (N) FOR A GIVEN VALUE OF MAGNITUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

= .100 SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE OF 0 414 OF 0 414 OF 0 65 33 .200 33 .200 33 .200 37 .200 37 .200 37 .200 38 .200 28 .20	ALPHA = .100 ALPHA = .150 AL
= .100 ALPHA = 5AMPLE 5AMPLE 56114 S 136 .100	ALPHA = .100 ALPHA = .100 BELTA SAMPLE .150 .100 .250
= .100 SAMPLE 136 65 39 26 136 1378 104 50 30 20 20 30 20 85 85 85 85 17 17 17 18 18 18 10 10 10 10 10 10 10 10 10 10	ALPHA = .100 DELTA SAMPLE .150 1493 .100 156 .250 25 .250 26 .100 104 .150 378 .100 104 .150 50 .200 20 .200 20 .200 20 .200 20 .200 20 .200 25 .200 20 .200 25 .200 26
	A P P P P P P P P P P P P P P P P P P P

SAMPLE SIZES FOR PAIRED AVALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMPLE SIZE (N) FOR A GIVEN VALUE OF MAGNITUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPMA) FOR

753 202 202 36 37 36 160 160 160 160 160 160 160 160 163 30 175 184 184 184 184 184 184 184 184 184 184		100 100 100 100 100 100 100 100	596 160 175 100 100 123 123 123 100 100 28	200 PRE 250 250 250 250 250 250 250 250 250 250	\$00 134 63 63 63 37 5 374 100 47 47 47 47 47 47 47 47 47 47 47 47 47	F TYPE 11 ALPHA DELTA -050 -150 -150 -150 -250 F TYPE 11 ALPHA DELTA	# .200 # .200	A) = .150 .150 .250 .250 .250 .150 .150 .250 .250 ALPHA DELTA .050	375 100 47 28 19 267 267 267 267 267 267 267 267 267 267
SANO SANO SANO SANO SANO SANO SANO SANO		150 .250 .250 .250 .250 .100 .150 .250 .250 .250	160 75 44 44 100 100 100 100 100 28 37 23 37 28 37 28 37 28 37 28 37 28 37 28 37 28 37 28 37 28 37 28 37 28 37 38 38 38 38 38 38 38 38 38 38 38 38 38	ALPHA DELTA		7 T P E C C C C C C C C C C C C C C C C C C	115 54 32 32 21 ERROR (BET 40 24 40 24 16 ERROR (BET = .200 SAMPLE 246 246 246 246 246 246 246 246	A	100 47 28 19 19 267 72 34 72 34 113 13 13 14 18 19 19 19 19 19 19 19 19 19 19 19 19 19
SAN		ALPHA = .250 .250 .250 .250 .250 .250 .250 .250	E = 30 30 30 30 123 34 123 374 100 28	ALPHA DELTA		T Y P E L	32 21 = .200 SAMPLE 314 84 40 24 16 ERROR (BET	ALP DELT 055	28 19 19 267 267 34 72 34 13 13 5849PLE
SAN SAN DAY		ALPHA = DELTA = .950150250250150150250150150150150150250	30 MPLE 1123 358 358 358 1123 374 E = 337 233 233 234	ALPHA DELTA	0 0	P T Y E L	21 ERROR (BET = .200 SAMPLE 314 40 24 16 ERROR (BET = .200 SAMPLE 246	ALP DELT 115 15 15 25	250 SAMPLE 267 34 34 20 13 13 SAMPLE 204
SAN ON SA		ALPHA = DELTA 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250 250	E = 1100 1100 1123 123 123 123 123 123 123 123 123 12	ALPHA DELTA	0	DEL DEL OCCUPATION OCC	= .200 SAMPLE 314 84 40 24 16 ERROR (BET	ALP DELT 055 055 055 055 055 055 055 055 055 05	
SAN OSE TO		ALPHA = .050150250250150150250150150150150150250250	100 123 123 58 34 23 23 100 100 28	ALPHA 0 050 100 200 200 200 200 200 200		P TY PE CONTRACTOR	= .200 SAMPLE 314 84 40 24 16 ERROR (BET	ALP 0ELT 055 125 255 18 1 1 2 2 3 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
SAN	1	DELTA	MPLE 123 34 34 123 34 123 34 100 100 28	DELTA 		7 TY PE DEL	SAMPLE 314 84 40 24 16 ERROR (BET 3 SAMPLE 246	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	T ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
SAN SAN DE SAN D		250 250 250 250 350 350 360 360 360 360 360 360 360 360 360 36	123 58 34 23 23 100 100 28	ALPHA PELTA DELTA DELLA DELTA DELLA			314 84 40 24 16 16 ERROR (BET SAMPLE 246		~ ~ ~ ~
SAN		.100 .200 .200 .250 UF DCCUR ALPHA = DELTA .100 .100 .250	123 58 34 23 23 100 47 47 28	150 .150 .250 .250 .250 .100 .100			84 40 24 16 16 ERROR (BET 8 AMPLE 246	ALP DELT -05	N E N
		150 .200 .200 .250 uF OCCUR ALPHA = DELTA .100 .100 .250	58 34 23 23 100 MPLE 47 47 28	.250 .250 .250 .250 .250 .050 .050		7 TY PE 0.00	24 24 16 ERROR (BET = .200 SAMPLE 246		N I N
		200 250 UF DCUR ALPHA = DELTA 050 .150 .250	34 23 100 MPLE 374 47 47	.250 .250 .250 .250 .050		F TY PE	24 16 ERROR (BET 200 SAMPLE 246	ALP DELT	N X N
		.250 JE DCCUR ALPHA = JEN JEN JEN 250 250	E = . 100 MPLE 374 47 47	ALPHA DELTA .050		AL DEL	16 ERROR (BET * .200 SAMPLE 246	ALP DELT 5	N I N
SANO SANO SANO SANO SANO SANO SANO SANO			E = . 100 MPLE 374 100 47	ALPHA DELTA .050		P TYPE	ERROR (BET 200 246 246	ALP DELT .05	CO ME CO
		300000 H	100 100 100 47	DELTA .050 .100	153 SAMPLE 299 80 39	DELTA .050		DELTA .050	N E N
SAN		.050 .100 .150 .200	374 374 100 47	. 050 . 100	299 299 80 39	DELTA .050	SAMPLE 246	.050	E (V)
SAH SAH		.050 .150 .200	374 100 47 28	. 100	29.9 80.0 8.0	.050	246	.050	504
SAH SAH 1		.100 .200 .250	100 47 28	.100	8 8 3 8				-
SAH SAH 1		.200 .200	28	150	39	.100	0	.100	22
SAH 4 4 1		.250	28			.150	31	.150	56
PRO 1		.250	::	. 200	25	.200	61	.200	15
PRO SATI					2	067.	7	067.	2
SAN		OF OCCURANC		200 PRO	DBABILITY D	F TYPE 11	ERROR (BETA	A)200	
PRO 1		AL PHA .	.100	ALPHA .	150	ALPHA	200	ALPHA	•
980		DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE		SAMPLE
PRO		.050	314	050	545	.050	198		1 60
PRO		001.	98	.100	99	.100	53		43
PRO		.150	40	.150	31	.150	52		12
PRO	32	.200	54	. 200	19	.200	15		12
PRO	1	5	2	nco. "	1	1	3	1:	•
	PRUBABILITY	UP UCCURAN		200	KUBABILIIT	1	ERKUR IBELA		
.050	50	ALPHA .	.100	ALPHA	.150	ALPHA		ALPHA	250
SAM	PLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
3	75	.050	267	.050	504	.050	160	.050	127
-	001	.100	7.5	. 100	55	.100	43	.130	34
	47	.150	34	.150	56	.150	21	.150	16
	28	-200	50	. 200	15	.200	12	.200	01
	19	.250	13	.250	2	.250		•520	1

SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMPLE SIZE (N) FOR A SIVEN VALUE OF MAGNITUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPMA) FOR

PROBABILITY	250 32	. 150 73	.050 .493 .150 .150 .200 .250 .250	DELTA SAMPLE .050 429 .100 113 .150 52 .250 20
.050 SAMPLE 682 179 83 48	ALPHA = .100 ALPHA = .100 DELTA SAMPLE .050	ALPHA = .153 DELTA SAMPLE .150 050 428 .100 113 .150 52 .200 33	E E	ALPHA = .100 DELTA SA .150 .150 .250 .250
.050 SAMPLE 573 150 150 41 27	ALPHA = .100 DELTA SAMPLE .050 DELTA SAMPLE .050 .150	ALPHA = .150 DELTA SAMPLE .050 .150 90 .150 42 .200 24 .250 15	DF TYPE 11 ERROR (BETA ALPHA = .200 DELTA SAMPLE .050 281 .100 74 .150 34 .200 20 .250 13 DF TYPE 11 ERROR (BETA	ALPHA = .250 ALPHA = .250 DELTA SAMPLE .050 23 .100 62 .150 62 .250 17 .250 17
	ALPHA = .100 DELTA SAMPLE .050 360 .100 95 .150 26 .200 26	ALPHA = .150 DELTA SAMPLE .050 74 .100 34 .200 20	ALPHA = .200 DELTA SAMPLE .050 226 .100 60 .150 28 .200 16	ALPHA = .250 DELTA SAMPLE .050 189 .150 23 .200 13
.050 SAMPLE 429 113 52 30	AL PHA = .100 AL PHA = .100 DELTA SAMPLE .050 305 .100 80 .150 37 .200 22	ALPHA = .153 DELTA SAMPLE .050 .050 233 .100 62 .150 23	ALPHA = .200 DELTA SAMPLE .050 .150 .150 .23 .260 .23	TA) = .250 ALPHA = .250 DELTA SAMPLE .050 145 .100 38 .150 18 .250

SAMPLE SIZES FOR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMPLE SIZE (N) FOR A GIVEN VALUE OF MAGNITUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

.050 .050		AL PHA	.100	ALPHA	.150	ALPHA =	.200	ALPHA =	.250
000	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	T ,
	266	000	1961	060.	163	000	141	000	122
.150	112	.150	6.80	.150	75	.150	79	.150	56
.200	59	.200	51	. 200	43	.200	37	.200	32
.250	45	.250	33	.250	23	.250	54	.250	21
	PROBABILITY	TY DF DCCURA	NCE =	.300 PRO	ROBABILITY O	OF TYPE 11 E	ERROR (BETA	.100	
ALP HA =	.050	AL PHA	•	ALPHA =		ALPAA =	•	ALPHA .	.250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	751	050.	517	.050	471	050	396	050.	336
.100	194	.100	149	.100	122	.100	103	.100	87
.150	68	.150	69	.150	56	.150	47	.150	04
.200	51	.200	39	. 200	32	-200	27	•500	53
	PROBABILITY	0F 0CC			7	F TYPE 11	3ET	A) = .150	
ALP HA =	.050	AL PHA	• .100	ALPHA .	.150	ALPHA =	200	ALPHA .	250
DELTA	SAMPLE	DEL TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050	630	050	471	.050	377	.050	310	050	157
.100	163	.100	122	.100	98	.100	80	.100	67
.150	75	.150	95	.150	45	.150	3.7	.150	31
2500	6 d	250	35	.200	26	200	21	250	18
	PROBABILITY	90	AN	300 P	0	F TYPE 11	ERROR (BETA	-	
ALPHA .	.050	AL PHA	.100	ALPHA .	.150	ALPHA .	.200	ALPHA .	.250
ELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050	543	050	396	.050	313	050	549	.050	202
.100	141	.100	103	.100	60	.100	59	•100	23
150	99	000	4 .	000	2	001.	30	000	\$:
.250	54	.250	81	. 250	11	.250	: 5	.250	•
	PROBABILITY	0F 0C	CURANCE	.300 PRO	ROBABILITY O	F TYPE 11	ERRUR IBETA	052 (1	
ALPHA =	.050	AL PHA	* .100	ALPHA =	.153	ALPHA =	.200	ALPHA .	250
DELTA	SAMPLE		SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050	472	.050	336	.050	257	.050	202	.050	160
100	122	.100	87	. 100	67	.100	23	001.	?:
.150	26	.150	65	.150	31	.150	57	061.	2
.200	23		•	000	•			•	:

SAMPLE SIZE IN) FOR PAIRED AVALVEIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMPLE SIZE IN) FOR A GIVEN VALUE OF MAGNITUDE (DELIA), MITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

95LTA -050		THO T	-100	4.1	- 010	.15)	Trd ::	"		# VH d	250
	SAMPLE	DELTA	SAMPLE	SEL	DELTA	SAMPLE	0FLT4				SAMPI
	1014	050.	403	CA	0.5	674	.050			050	504
	25-	.100	235		00	172	.133	148		30	1 29
	117	.150	43		.150	7.9	.153	57		150	58
	1.9	.205	5.3	. 2	00	**	.200	3.8		000	33
	43	.250	34		20	53	.250	52		.250	21
	PRUBABILIT	TY OF OCCURANC		.350	PRUBA	BABILITY 3	F TYPE 11	FRROR (BETA		.100	
ALPHA =	.050	AL PHA	.100	AL	ALPHA =	.153	ALPHA	200		ALPHA =	.250
	SAMPLE	DELTA	SANPLE	DEL	TA	SAMPLE	DELTA	٠,	۵	DELTA	SAMPLE
	803	090.	616	0.	50	50¢	.053			050	359
.130	502	001.	158		.100	129	.100	108		.130	76
	63	.150	7.1	-:	50	80	.150			150	75
	53	.200	1,	.2	00	33	.200			000	57
	34	.250	92	.2	50	21	.253			050	15
	Tar an inc.			000	000	n i i i i i a wood		LAKUK 1851	4	001.	
# 7H .	.050	AL PHA	.100	AL	ALPHA =	.150	ALPAA	200		ALPHA =	.250
	SAMPLE	DELTA	SAMPLE	DELTA	V	SAMPLE	DELTA		٥	TA	SAMPL
050	674	050.	504	.050	20	403	.050	331		050	574
	174	001.	129	.1	00	103	.100			00	70
	7.5	.150	28		20	47	.153			20	35
	77	002.	33	.2.	00	27	.203			000	18
	53	.250	21	.2	20	11	.250			05	15
	PRUBABILI	TY OF DECURANCE		.350	PRUBA	PRUBABILITY 3F	F TYPE 11	ERRUR (B	(BETA)	.200	
H H	.353	AL PHA .	100	ALI	"	.153	ALPHA	.230		ALPHA .	.250
	SAMPLE	DELTA	SAMPLE	DELTA	5	AMPLE	DELTA		•	DELTA	SAMPLE
.050	5.83	.050	453	0.		331	.050	566	0.	050	216
	8.71	.100	104	.100		60	.133	99	-	.130	55
	10	001.	•	•		33	.150	31	•	20	52
	3.4	007.				22	002.	* -		00	15
	52	.250	8			*	.250	15	~.	05.	6
	PROBABILIT	TY OF OCCURANCE		.350	PRUBA	PRUBABILITY 3	F TYPE 11	ERROR (BET	•	.250	
H. 4.	.050	ALPHA =	100	AL	"	.153	ALPHA	200		ALPHA .	.250
ELTA	SAIPLE	DELTA	SAMPLE	DELTA	S	AMPLE	DELTA	SAMPLE	٥	DELTA	SAYPLE
	204	.050	353	0.		274	.050	216		000	171
	120	001.	3.5	.1.		5	.100	55	•	00	77
	.:	150	7.5	.150		35	.150	52	-	20	50
	2.2										
	33	.205	5.4	. 2		1 9	.200	15	2.	00	12

FDR SAMPLE SIZES FOR PAIRED AVALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT 5445

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.250 34 21 22 23 24 250 134 250 34 250 34 250 21 21 250 34 250 21 21 250 21 21 21 21 21 21 21 21 21 21 21 21 21	ALPHA * DELTA * 050
605 .056 153 .106 69 .156 39 .206 25 .256	05 69 69 25 25 (BETA) 112
	153 69 39 25 ERRÜR (BET 5AMPLE 541 112
.250 .250	w
23.5	£ .
.250	88 "
067.	ALPHA DELTA

	ALPHA = .1 LELTA SAM .050 6.100
	.050 SAMPLE 837 212
	050 SAMPLE 837 212
	ALPHA: 001174 0130

SAMPLE SIZES FOR PAIRED AVALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMP

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SAMPLE SIZES FOR PAIRED AVALVSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMPLE SIZE (N) FOR A GIVEN VALUE OF MAGNITUDE (DELTA), MITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPMA) FOR

IF TYPE II ERRUR (BETA)050	ALPHA = .250 ALPHA = .250 DELTA SAMPLE DELTA SAMPLE	153	150	23 250	IF TYPE II ERROR (BETA) 100	A = .200 ALPHA =	SAMPLE DELTA S	450 •050	112 .100	49	.250 27 .250 23	F TYPE II ERROR (BETA)150	ALPHA200 ALPHA -	SAMPLE DELTA	352 .050	100	000	.250 13 .250	F TYPE II ERROR (BETA) .	A = .200 ALPHA =	E DELTA SA	283 .050	001. 07	31 .150	6 052 11 057	F TYPE II ERROR (BETA)250	A = .200 ALPHA =	CAMBI E DELTA	מאיונור מנויא	230 .050	.050 230 .050 182 .050 .182 .050 .182 .050 .182 .050 .182 .050 .182 .050 .182 .050 .050 .050 .050 .050 .050 .050 .05
.500 PROBABILITY O	ALPHA = .153 DELTA SAMPLE				500 PRUBABILITY 3	ALPHA = .150	S			1.	250 32	SOO PRIBABILITY D	ALPHA = .150	S		100 106		.250 16	500 PROBABILITY O		DELTA SAMPLE				13 003.	ROBA		S	•		100
Y DF DCCURANCE .	ALPHA = .100 DELTA SAMPLE			.250 32	TY OF DCCURANCE	AL PHA = .100	S				.250 24	JRANCE = .	AL PHA = .100	S	-		1	.250 20	JRANCE		DELTA SAMPLE				250025	URANCE		,			.100 95
PRUBABILIT	ALPHA = .050 DELTA SAMPLE				PROBABILI	ALP HA = .050	SA				.250 32	PROBABILI		SA				.250 27	ä	ALP HA = .050	SA		.100 153	-	250 037	P.80		SA	,	,	.100 133

SAMPLE SIZES FOR PAIRED AVALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT

20	HA = .250						.100						77 0		00						2 2				٠,					20		SA			
	ALPHA	,					A) .	ALP	OFL T	•00	.13	.15	.200			ALP	DELT	•00	01.	51.	250		2	ALP	DELT	•00	ci.		.250	ETA)2	ALPHA	DELT	•00	01.	.15
EKKUK IDEI	200 CAMPIF	617	155	69	38	54	ERRUR (BET	.200	SAMPLE	450	113	20	28	8	ERRUK IBE	200	SAMPLE	352	10 (10 (39	77	FREDR FRET	2	200	SAMPLE	283	11	36	11	ERROR (BE	• .200	SAMPLE	230	28	92
IL INPE II	ALPHA	050	.100	.150	.233	.250	DF TYPE 11		O				.200	.250	11 3411 10	ALPHA	DELTA	.050	001.	051.	250	DE TYPE 11	•	ALPHA	DELTA	050	.100	.150	.250	DF TYPE 11	ALPHA	DELTA	050	.100	.150
KUSABILIIY	.15)	717	183	83	**	58	ROBABILITY	153	SAMPIF	536	134	63	33		KUBABILITT	150	SAMPLE	428	107	5	\$ C			150	SAMPLE	352	on (33	7	_	153	SAMPLE	292	73	33
34	ALPHA	050	.100	.150	. 200	.250	.550 PR	ALPHA	DELTA	.050	.100	.150	. 200	. 250		ALPHA	DELTA	.050	001.	051.	250			ALPHA	DELTA	050	.100	000	. 250	550 P	ALPHA	DELTA	.050	.100	.150
ULLUKANTE .	100	459	214	9.6	53	33	NCE .	. 100	SAMPIF	656	164	73	41	92		.100	SAMPLE	536	134	200	2.53			100	SAMPLE	450	113	200	81		100	SAMPLE	385	96	63
וא הג מנכם	AL PHA	050	100	.150	-200	.250	TY OF DCCURA	AL PHA	DEL TA	050	.100	.150	.200	?	IT UP UCCURAN	AL PHA	DELTA	.050	.100	061.	250	TY OF GCCURANS	5	AL PHA	DELTA	.050	.100	061.	.250	TY DF OCCURANC	AL PHA	DELTA	050	100	.150
PRUBABILI	050	1079	270	120	19	45	PROBABILI	.050	SAMPIF	854	214	95	53	33	PAUBABILI		SAMPLE	717	180	90	4 to	PRABILI	TOTAL		SAMPLE	617	155	60	56	PROBABILI	050.	SAMPLE	536	134	09
	ALPHA =	250	100	.150	2230	.250		ALP HA =	FITA	050	.100	.150	.200	.250		ALPHA =	ELTA	.050	100	.150	250			ALPHA =	FLTA	.050	100	061.	.250		ALP HA =	ELTA	.050	.100	.150

B-12 → =

SAMPLE SIZE (N) FOR A GIVEN VALUE OF MAGNITUDE (DELTA), MITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

cic

.100 .100 .150 .250 .250	ALPHA .	.050	AL PHA =	.100	ALPHA .	.153	ALPHA	200	ALPHA .	.250
6.1.1.2.2.4	TA.	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
	050	1058	.050	837	.050	705	.050	608	050	256
	00	267	.100	212	.100	173	001.	153	001.	133
	000	160	061.	42	001.	0.0	061.	60	001.	200
. A	00	19	.200	53	. 200	45	.200	39	007.	34
Te	20	43	.250	34	.250	53	.250	52	.250	21
AL		PROBABILITY	TY OF OCCURANS	INCE = .600		PRUBABILITY OF	TYPE 11	ERROR (BETA		
•	ALP HA =	.050	AL PHA =	.100	ALPHA .	.150	ALPHA	200	ALPHA .	.250
DEL	TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
••	050	837	.050	643	050	525	050	441	050	374
-	.100	212	.100	163	.100	133	.100	112	•100	95
-	50	95	.150	73	.150	69	.150	20	.150	43
.2	00	53	.200	4.1	.200	34	.200	8.2	.200	54
.2	150	34	•250	. 92	.250	21	.250	18	.250	15
	1	C u	100							9
1	AL	0000	AL LUA			2000	ALTA	2000	ALT 10	20000
A L TO		702	2000	525	2000	420	200	345	0.50	286
	000	178		133	100	104	200	A 7	001	23
: -	20	80	150	09	150	e 4	150	3.6	150	33
.2	000	45	200	34	. 200	27	.200	22	-200	19
-2	-250	62	.250	12	.250	17	•250	14	.250	12
And the second property of the Control of the Contr		PROBABILITY	TY DE DCCURANCE	09.	O PROBA	BILITY	F TYPE 11	ERROR (BETA		
AL	ALPHA =	.050	ALPHA -	.100	ALPHA .	.150	ALPHA	200	ALPHA .	.250
DEL	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
••	050	605	.050	441	.050	345	.050	772	.050	522
	00	153	•100	112	.100	87	.100	10	.100	57
	150	69	.150	20	.150	39	.150	32	.150	92
.2	00	39	.200	28	. 200	22	.200	18	.200	15
.2	.250	25	.250	1.0	.250	14	.250	12	.250	•
		PROBABILITY	TY OF OCCURANCE	INCE600		PROBABILITY OF	TYPE 11	ERROR (BETA		
AL	PHA .	.050	AL PHA -	.133	ALPHA =	.153	ALPHA	.200	ALPHA .	.250
DEL	TA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
•	150	526	.050	374	.050	586	•050	525	•050	178
-	.100	133	•100	9.8	.100	73	.100	57	.100	45
-	50	09	.150	43	.150	33	.150	98	.150	02
~	00	34	.200	5.4	. 200	13	.200	15	•500	12

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SAMPLE SIZE IN) FOR A GIVEN VALUE OF MAGNITUDE (OELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

050 .050 .100 .200 .250	050	AL PHA =	.100	ALPHA =	.153	ALPHA =	.200	ALPHA .	.250
	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.100 .200 .250	1014	.050	803	.050	674	.050	580	050	204
.250	558	.100	205	.100	172	.100	148	001.	129
.250	111	.150	93	.150	78	.150	67	.150	28
250	67	200	53	. 200	55	.200	38	002.	33
	43	.250	34	.250	59	.250	52	.250	21
The second secon	PRUBABILITY	TY HE OCCURANC	ANCE650		PRUBABILITY DI	TYPE II E	ERROR (BETA	100	
	050.	AL PHA .	.100	ALPHA .	.150	ALPHA .	.200	ALPHA .	052
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	803	.050	616	.050	504	.050	423	050	359
.100	505	.100	158	.100	129	.100	108	001.	35
.150	93	.150	11	.150	58	.150	64	.150	25
.200	53	.200	41	. 200	33	.200	88	200	57
.250	34	.250	. 97	.250	21	.250	1.6	.250	15
	PRUBABILITY	TY DF DCCURANC	ANCE = .650	٠	ROBABILITY OF	TYPE 11	ERROR IBETA	1150	
				41014		AHOIA	000	- AHA IA	. 250
-1	000.	AL VIA	2010	AL TA	CAMPIE	O EI TA	SAMPI F	OFI TA	SAMPLE
DELIA	SAMPLE	4 2 2 2	34876	080	403	050	331	050	274
0500	1/0	0000	200	000	103	001	28	100	20
001.	172	001.	671		601	1	3 6	051	2
041.	9	001	200	000	3.3	200	23	300	
007-	***	002.	2 .	0036		250	11	250	1
067	63	•	1			1			
	PROBABILITY	מני מכנה	ANCE650		PROBABILITY OF	TYPE 11	ERRUR (BETA	002.	
AI P HA	050	AL PHA	. 100	ALPHA .	.150	ALPHA .	.200	ALPHA .	.250
DEL TA	SAMPIF	1	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	580	050	423	.050	331	.050	992	050	216
100	148		108	.100	8 5	.100	89	001.	55
.150	67	.150	65	.150	38	.150	31	.150	52
-200	38		88	. 200	22	.200	1.8	.200	15
.250	52	.250	1.8	.250	16	.250	12	.250	6
	PRUBABILITY	TY DF DCCURANCE	65	0	PROBABILITY O	F TYPE II	ERROR IBETA	1 = .250	
	050	AL PHA =	.100	ALPHA	150	ALPHA	.200	ALPHA .	.250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	504	.050	359	.050	274	.050	216	050	171
.100	129	.100	26	.100	22	.100	25	100	33
.150	58	.150	45	.150	32	.150	52	.150	20
.200	33	.200	24	. 200	1.9	002.	15	.230	15
.250	22	.250	15	.250	12	.250	6	.250	•

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SAMPLE SIZES FUR PAIRED ANALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMPLE SIZE (N) FOR A GIVEN VALUE OF MAGNITUDE (DELTA), WITH A SPECIFIC PROBABILITY OF A TYPE I ERROR (ALPHA) FOR

	• 050	AL PHA =	.100	ALPHA =	.150	ALPHA .	200	ALPHA	~
•	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
2	798	050	289	050.	573	000	130	000.	115
.150	105	150	83	.150	22	.150	09	.150	52
	61	.200	64	. 200	1,	.200	35	.200	30
0	04	.250	32	.250	27	.250	23	.250	20
	PROBABILITY	OF OCCUR	RANCE # .75	6	RUBABILITY O	F TYPE 11	ERROR (BETA	1100	
	• .050	AL PHA =	.100	ALPHA =	153	ALPHA =	•	ALP	250
	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	MPLE	DELT	SAMPLE
_	682	0	524	050	458	.050	360	050	305
	179	.100	138	.100	113	100	66	.100	80
_	83	.150	64	.150	25	.150	55	.150	37
250	3.6	.250	37	. 200	202	250	17	250	75
-	PROBABILITY	OF OCCUR	MANCE = .75	0	ROBABILITY O	F TYPE 11	ERROR (BETA	150	
¥.	.050	AL PHA =		ALPHA .	.150	ALPHA -	200	ALPHA	250
_	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
_	573	.050	428	.050	345	.050	281	.050	233
0	150	.100	113	.100	93	.100	74	.100	62
.150	02	.150	52	.150	45	.150	34	.150	53
	1 .	002.	200	250	**	350	2 -	0030	::
			3	063.	1-	000	3		
	PROBABILITY	TY OF OCCURANC	TANCE = .75	0	ROBABILITY	F TYPE 11	ERROR (BETA	002-	
	050.	AL PHA =	•	•	1 .150	ALPHA .	.200	ALPHA	~
•	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
0	493	.050	360	.050	281	.050	556	•050	183
0	130	•100	56	.100	7.5	.100	09	001.	48
0	09	.150	55	. 150	35	061.	87	150	67
.250	5 23	.250	17	.250	3 2	.250	11	.250	9
	PROBABILITY	-	TANCE = .75	0	17 0	F TYPE 11	ERROR (BETA)250	
HA	050	4	100	ALPHA .	153	ALPHA .	200	ALPHA	
4	SAMPLE	DELTA	SAMPLE	DELTA	SAMP, E	DELTA	SAMPLE	DELTA	SAMPLE
0	459	•050	305	.050	233	.050	183	.050	145
0	113	.100	00	. 100	95	100	8	.100	38
.150	25	•150	37	.150	62	.150	٤2	.150	18
0	30	2002	22	. 200	1:	2020	13	052.	= "

IA) FOR SAMPLE SIZES FOR PAIRED AVALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT SAMPL

	.250 SAMPLE 375 100 47 47 28	.250 SAMPLE 267 72 34 20 13	250 204 204 204 55 55 15	.250 SAMPLE 160 43 12	.250 SAMPLE 127 34 16
• .050	ALPHA = DELTA .050 .150 .250 .250	ALPHA = 0ELTA	ALPHA = DELLA 100 15	ALPHA = 06LTA	ALPHA = .050 .150 .200
PROBABILITY OF TYPE II ERROR (BETA)	.230 SAMPLE 431 115 54 32 21	ERROR (BETA) 200 SAMPLE 314 94 40 24 16	ERROR (BETA) 200 246 66 31 12	ERROR (BETA) SAMPLE 198 25 15 10 ERROR (BETA)	.200 SAMPLE 160 43 21
1 YPE 11 t	ALPHA = DELTA .050 .150 .200 .250	ALPHA = DELTA DELTA - 100 - 150 - 250 - 250	ALPHA = DELTA -050 -150 -250 -250	ALPHA DELTA 050 050 050 050 050 050 050 050 050 05	ALPHA 050.050.100.150
SABILLIY JI	.150 SAMPLE 500 134 63 37 25	A S SAMPLE 374 150 47 100 47 100 47 100 100 100 100 100 100 100 100 100 10	PRUBABILITY OF SAMPLE SAMPLE 80 38 22 22 15	PROBABILITY OF A = .150 245 65 31 19 12 PROBABILITY OF	
	ALPHA # DELTA .050 .100 .200 .250	ALPH DELTA 050. 050. 150. 250.	ALPH DELTA .050 .100 .150	ALPHA DELTA .050 .150 .250	ALPHA 050 100 150
N	.100 595 160 75 44		= .80 20 74 60 60 19	ACE = .800 SAMPLE 314 40 24 40 24 16 86 88 88 88 88 88 88 88 88 88 88 88 88	245 7 E
י יו וינטאם	ALPHA = .350 .100 .150 .250 .250	ALPHA = .11 DELTA SAM .100 .150 .250	ALPHA = .11 ALPHA = .10 DELTA SAM .050 .150 .150 .250	ALPHA = 10 ALPHA = 10 DELTA SAME 100 100 150 200 200 200 200 200 200 200 2	
PREBABILITY OF UCCURANCE =	.050 SAMPLE 753 202 95 95	.050 SAMPLE 596 160 75 44	PRUBABILIT	.050 SAMPLE 431 115 54 21 21 21 21	.050 375 100 47
	ALPHA =	ALPHA = DELTA - 1050 - 150 - 250 - 250	ALPHA = 0ELTA 0ELT	ALP HA =	ALPHA = 0550 -150

SAMP

	250 SAMPLE 310 85 41 25	250 SAMPLE 220 61 29 118	250 SAMPLE 169 47 23 14	.250 SAMPLE 133 37 18	.250 SAMPLE 105 29
050	ALPHA - 050 - 100 - 250 - 250 - 100 - 100 - 250	ALPHA = DELTA050150250250	ALPHA	ALPHA = DELTA - 050 - 150 - 150 - 250 - 250 - 250 - 250	ALPHA 050 150
PROBABILITY OF TYPE II ERROR (BETA) .	= .200 356 356 98 47 47 19 ERRUR (BETA)	200 SAMPLE 260 72 35 21 14 ERROR (BETA)		ERROR (BETA) 200 SAMPLE 164 45 22 22 22 13 13	200 SAMPLE 133 37
F TYPE 11	ALP4A DELTA .050 .100 .150 .200 .250	ALPHA DELTA .050 .100 .200 .250	ALPHA DELTA .053 .163 .150 .200	ALPHA DELTA	ALPHA DELTA .050 .100
BABILITY D	A = .150 SAMPLE 414 114 55 33 22 PRUBABILITY OF	A = .153 309 85 41 25 17 PROBABILITY DF	.150 SAMPLE 247 69 33 20 14	A = .153 A = .153 203 55 27 15 115 PROBABILITY OF	.153 SAMPLE 169 47
	06114 050 050 1000 1500 2500	ALPH DELTA .050 .100 .200	ALPH DELTA .050 .100 .150	ALPH DELTA .050 .100 .150	ALPHA = DELTA .050 .150
.850	058.	. 850		. 850	
RANCE =	= .100 493 196 199 196 196 196 198 198 198 198 198 198 198 198 198 198	SAMPLE 378 104 50 50 20 20	SAMPLE 309 85 41 25	SANCE = 100 SAMPLE 260 72 35 21 14	100 SAMPLE 220 61
Y OF DCCU	AL PHA = .1 DEL TA SAM .050 .150 .150 .250 .250	AL PHA = .17 DEL TA SAM .050 3 .150 .150 .250 .250	ALPHA DELTA .350 .100 .200	AL PHA = .10 DELTA SAMP .050 .250 .250 .250 .250 .250 .250 .250	DELTA .050 .150
PROBABILITY OF OCCURANCE	.050 54MPLE 623 171 82 49 33	.050 54MPLE 493 136 65 39 26 26	.050 \$AMPLE 414 114 33 22	.050 SAWPLE 356 98 47 28 19 PRUBABILITY	.050 SAMPLE 310 85
4	ALPHA = 5.050150250	ALPHA = S	ALPHA = S .050 .100 .100 .200	ALP HA = S	ALPHA = S-050 - 150

SAMPLE SIZES FUR PAIRED AVALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT

ALPHA = .050 ALPHA = .1 250 470 .150 .150 1150 67 .150 250 28 .100 1150 67 .150 250 28 .150 250 28 .250 250 37 .250 250 37 .250 250 37 .250 250 28 .250 250 45 .150 250 28 .250 250 45 .150 250 45 .150 250 45 .150 250 45 .150 250 45 .150 250 45 .150 250 45 .150 250 45 .150 250 45 .150 250 45 .150 250 26 .150 260 26 .250 27 .100 280 .150 2					ITPE II ERKUR (BEIA)	060.	
SAMPLE DEL 470050050 AL 28050 AL	.100	ALPHA =	.150	ALPHA =	.200	ALPHA .	.250
470 470 41 41 41 28 41 28 41 28 28 37 29 29 29 29 29 29 29 29 29 29	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
1355 1355 1356 1357 1357 1357 1357 1357 1357 1357 1357	372	.050	312	050	569	•050	234
PRUBABILITY OF SAMPLE	101	001.	2.4	001.	- 6	001.	100
PRUBABILITY UF SAMPLE 3372 1077 1077 1077 1088 PRUBABILITY OF SAMPLE SAMPLE 109 109 109 109 109 109 109 10	23	000		2000	200		
= .050 ANDRE DEL 107 107 107 107 103 103 103 103 105 104 105 105 105 105 105 105 105 105	533	.250	13	.250	1 6	.250	14
SAMPLE DEL 372 372 107 107 23 23 24 25 26 19 26 26 26 26 26 26 27 26 26 27 26 26 27 26 26 27 26 26 27 26 26 26 27 26 26 27 26 26 26 27 26 26 27 26 26 27 26 26 27 26 26 27 26 26 27 26 26 27 26 26 27 26 27 26 27 26 26 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 27 28 26 27 26 27 27 28 26 27 27 28 26 27 27 28	ANCE = .900	•	RUBABILITY OF	TYPE 11 E	ERROR (BETA)	• .100	
SAMPLE DEL 197 197 197 197 197 197 197 197 197 197	.101	AI PHA =	.153	AH PHA	. 002	AL PHA .	.250
372 107 33 33 23 23 23 22 24 26 26 26 26 26 26 26 26 26 26 26 26 26	SAMPLE	DELTA	SAMPLE	DFLTA	SAMPLE	DELTA	SAMPLE
107 53 53 23 24 26 27 26 27 26 27 26 27 26 27 26 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 27 26 27 27 28 29 20	285	.050	233	.050	196	050	166
PRUBABILITY OF SAMPLE 312 312 312 50 40 50 14 50 19 50 19 50 19 50 10 10 10 10 10 10 10 10 10 10 10 10 10	82	.100	67	.100	57	.100	84
23 23 22 23 22 23 22 24 22	41	.150	33	.150	88	.150	57
PRUBABILITY DE SAMPLE 312 90 128 19 28 19 28 28 27 77 77 26 269 269 269 269 27 269 269	25	. 200	14	.200	71	.200	2 2
050 AL SAMPLE DEL 90 .1 45 .2 18 .2 19 .2 SAMPLE DEL 269 .0 77 .1 38 .1 16 .2 PROBABILITY OF .2 24 .2 24 .2 24 .2 25 .0 26 .0 27 .1 38 .1 26 .0 27 .0 26 .0 27 .0 27 .0 28 .0 26 .0 27 .0 27 .0 28 .0 26 .0 27 .0 26 .0 27 .0 26 .0 27 .0 27 .0 28 .0 26 .0 27 .0 27 .0 28 .0 26 .0 27 .0 27 .0 28 .0 26 .0 27 .0 27 .0 28 .0 27 .0 28 .0 27 .0 28 .0 28 .0 27 .0 28 .0 27 .0 28 .0 27 .0 28 .0 28 .0 27 .0 28			111111111111111111111111111111111111111		Turing to the total tota		
SAMPLE DEL 312 312 45 28 19 28 26 269 269 269 264 264 264 264 264 264 264 264 264 264 264 264 264 264 264 2669 266	.100	ALPHA =	.150	ALPHA .	002.	ALPHA :	. 550
312 490 28 28 29 20 20 34 24 24 24 24 24 24 24 24 24 24 24 24 24 24 25 24 26 27 26 26 27 26 27 26 27 26 27 27 26 27 27	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
28 .28 .2 28 .28 .2 29 PROBABILITY OF .2 SAMPLE DEL .2 77 .1 24 .2 16 .2 16 .2 16 .2 16 .2 16 .2 16 .2 16 .2 17 .2 18 .050 AL	233	050	187	050	153	050	127
28 2 19 2 SAMPLE DEL 27 3 77 38 38 3 24 2 24 2 PROBABILITY OF 2 SAMPLE DEL 2 SAMPLE DEL 2 234 3	200	001.	* .		* .		
269 AL 24 28 AN PLE 24 24 24 28 24 28 24 28 24	21	200	17	200	14	200	2:
050 AL SAMPLE DEL 269 .0 77 .1 38 .1 24 .2 16 .2 PRUBABILITY OF 050 AL SAMPLE DEL 234 .0	14	. 250	12	.250	01	.250	
269 0EL 269 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ANCE900	•	RUBABILITY OF	TYPE 11 E	ERROR (BETA)	• .200	
SAMPLE DEL 269 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0	.100	ALPHA =	.150	ALPHA =	.200		.250
269 .0 77 .1 38 .1 24 .2 16 .2 16 .2 PRUBABILITY OF SAMPLE DEL 234 .0	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE		SAMPLE
77 38 .1 24 .2 16 .2 16 .2 PRUBABILITY OF SAMPLE DEL 234 .0	196	050.	153	.050	123	.050	1 00
38 .1 24 .2 16 .2 16 .2 PROBABILITY OF SAMPLE DEL 234 .0	57	.100	4,4	.100	36		53
24 .2 16 .2 PROBABILITY OF SAHPLE DEL 234 .0	87	.150	22	.150	18		12
16 .2 PRUBABILITY OF SAMPLE DEL 234 .0	17	. 200	14	.200			6
= .050 AL SANPLE DEL 234 .0	12	.250	13	.250			•
050 SANPLE 234	NNCE900	PRO	ROBABILITY OF	TYPE 11 E	ERROR (BETA)	250	
SANPLE 234 67	.100	ALPHA =	.153	ALPHA =	.200	ALPHA =	.250
234	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
4.7	166	.050	127	.050	100	•050	4
	80 7	.100	37	.100	53	.100	23
33	57	.150	£ :	.150	15	.150	2
12	15	. 200	-	.203	•	.230	1

SAMPLE SIZES FUR PAIRED AVALYSIS WHERE THE SIGN OF THE DIFFERENCE IS IMPORTANT

	LAUGABILI	THE DECOURAGE			יייייייייייייייייייייייייייייייייייייי				
ALPHA .	.050	AL PHA =	100	ALPHA .	.150	ALPHA	.200	ALPHA .	.250
000	293	0 C C C	232	050	105	20.00	167	050	146
100	6	100	73	100	19	100	53	.130	46
.150	84	.150	38	.150	35	.150	87	.150	57
.200	31	002.	52	.200	21	.200	91	.230	16
.250	22	.250	18	.250	15	.250	13	.250	=
	PROBARILIT	TY OF OCCURANCE		.950 PRD	PRUBABILITY O	JF TYPE 11	ERROR (BETA	A)100	
ALP HA =	.050	AL PHA =	.100	ALPHA .	.150	ALPHA	200	ALPHA .	.250
SELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050	232	.050	178	.050	145	.050	122	.050	104
.100	73	.100	95	.100	4.6	.100	39	.100	33
.150	38	.150	62	.150	5,2	.150	50	.150	17
.200	52	.200	19	. 200	9	.200	13	.200	=
063.		1		663.	. :			200	•
-	THE PARTY OF THE P	1							
ALPHA =		AL PHA -	.100	ALPHA =	.150	ALPHA	• .200	ALPHA .	250
ELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPL
.050	195	.050	146	. 050	116	.050	96	•050	79
.100	5	.100	46	. 100	37	.100	30	.100	52
.150	32	.150	54	.150	19	.150	16	.150	13
.200	21	• 500	16	. 200	2	.200	01	.230	•
.250	15	.250	=	. 250	•	.250	•	.250	•
	PROBABILIT	TY DE DCCURANC		950 PRO	PROBABILITY O	IF TYPE 11	ERROR (BETA	A)200	
ALPHA =		AL PHA .	.100	ALPHA .	.150	ALPHA	• .200	ALPHA .	.250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
050	167	•0 50	122	050.	96	.050	11	.050	63
.100	53	.100	39	.100	32	.100	54	.130	20
.150	88	.1 50	20	.150	16	.150	13	.150	=
250	2 5	2500	E •	250	2*	250	∞ ∢	052	- 5
	PROBABILIT	TY OF OCCURANCE		.950 PRO	PROBABILITY O	7	ERROR	:	
ALPHA .		AL PHA .	.100	ALPHA .	.150	ALPHA	200	ALPHA .	250
DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE	DELTA	SAMPLE
.050	146	.050	104	050.	73	.050	63	.050	20
.100	46	.100	33	.100	\$2	.100	50	001.	2
.150	5 7	.150	7:	.150	13	.150	='	.150	•
250	9:	2500		250	,	250	- 0	052	0 4
2730		200		2000					